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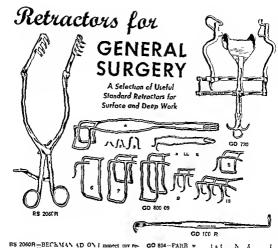
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# **SURGERY**

# GYNECOLOGY AND OBSTETRICS

An International Magazine, Published Monthly

VOLU 1E 81

JULY 1945

NUMBER I

# PRIMARY RESECTION (CLOSED ANASTOMOSIS) OF RECTAL AMPULLA FOR MALIGNANCY WITH PRESERVATION OF SPHINCTERIC FUNCTION

Together with a Further Account of Primary Resection of the Colon and Rectosigmoid and a Note on Excision of Hepatic Metastases

OWEN H WANGENSTEEN MD FACS Mn e polis Minnesota

COMEWHAI more than 2 years ago the results in this clinic of primary resection of the colon without antecedent complemental or supplemental colos gave in the presence of acute obstruction were set forth (34). At the same time a preliminary report was made upon cflorts directed at salvage of phinctine function in the radical abdominal operation for carcinoma of the rectal ampulia.

It is the writer's intent in this paper to re port upon the exprence of this clim, with the surgery of colonic main nancy since the time of the earlier report (April 1943) and to elab orate particularly upon a more extended experience with the operation for carcinomia of the rectal ampulla with attempts at pressrus tion of sphinterie function. Whereas experi ence with this latter operation still has been

 small nevertheless it has been adequate to indicate that in suitable cases radical excision of the lesion with preservation of sphincteric function is a feasible and practical procedure

# HOSPITAL MORTALITY IN PRIMARY RESECTION OF COLON AND RECTOSIGMOID

The earber report referred to above cm braced a 2 year period during which time 61 patients underwent colonic resection with 1 hospital death. During the 19 month interval which has elapsed since that report (April 1943 to November 1 1944) an additional 78 patients have undergone resection of the colon including the rectosigmoid. All were primary resections save 2 in which exteriorization was done. One of these had a volvulus of the pelvic colon, the other an inflammatory lesson in the transverse colon. There were 6 deaths in the group 3 of which are classified as in avoidable, 2 the result of peritonitis and 1 of pneumonia.

I ordable deaths. In r of these patients primary resection was undertaken at the time

# SURGERY GYNECOLOGY AND OBSTETRICS

TABLE I-HOSPITAL MORTALITY

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of decompression of the colon for acute ob struction The patient had a malignant growth in the pelvic colon with great distention. It obviously was a mistake in the in stance to have undertaken decompression of the colon and primary anastomosis at the same time. The success of primary resection without antecedent or complemental colos tomy in the earlier series ugacsted that it might be feasible to deal with the obstructed colon in the manner in which the obstructed small bowel is managed at operation by aseptic decompression suction enterotomy ( ) Upon decompression the edematous walls of the obstructed colon however appear to separate into favers making suture somewhat difficult. This occurrence was noted too in a subsequent case in which primary resection of the pelvic colon was undertaken soon after spontaneous decompression of an enormou ly distended colon

The other death from peritoniti occurred in a patient with a dubiously operable lesion adherent to the urinary bladder and the anterior as well as the posterior abdominal wall In the light of the exten ive operation undertaken in the patient it might have been well to have made a complemental colo tomy Obviou Is in the case of the patient with the acute obstruction an antecedent colo toms should have been carried out

One of the avoidable deaths requires pecial comment it occurred in an obese elderly man with carcinoma of the transverse colon who also had a moderately active diverticulity of the pelvi colon cau ing some vmptoms Pri mary resection of the transverse colo wa

done the patient dying of pneumonia. In this patient an exteriorization operation probably would have been tolerated better it too would have been better treatment for the diverticulitis The only other alternative would have been to excise the major portion of the colon anastomosing cecum to the fer minal pelvic colon an operation even more formidable than the one the patient did not survive It would have possessed the ad vanta e however of ridding the patient of the complicating diverticulitis

The most complicated resections in thi series of colon cases are constituted by the tran verse colon group. Of the 1 nationts in the group 7 had simultaneous resection of the stomach pancreas or other viscus. In these 7 pati nts the primary lesion was a gastric lesion a gastrojejunocolic fistula or a car cinoma with invasion of the transverse colon The case referred to was the only death in the tran erse colon group

The operative mortality for these two period of study is summarized in Table I For the earlier period the operative mortality sa 16 per cent for the latter 76 per cent for both period to ether , per cent It i to be noted however that there were no unavoid able deaths in the fir t period wherea in the latter there were 3 (see Table I) In any series of patients operated upon I r ceral mal nancy the item of unavoidable deaths from large (35) An element of unusual good for tune attended our efforts in the first series in shich there were no death from unavoidabl cause in the latter se is half (th deaths ua fail n (otofo) n

PRIMARY RESECTION OF RECTAL AMPULLA FOR CANCEP WANGENSTEEN

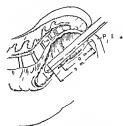
Una ordable deaths The unavoidable deaths were due to (t) heart failure in an obese badly decompensated patient with a large in vasive lesion of the rectosigmoid ( ) arterial thrombosis of both renal arteries in a decom pensated patient who underwent primary re section for cancer of the pelvic colon (3) an unexplained sudden death in a diabetic (not insulin shock as far as the record indicates) approximately 48 hours after an easy primary resection for carcinoma of the pelvic colon

# HOSPITAL MORTALITY IN AMPULLARY RECTAL RESECTION

Since the former report 20 additional pa tients have been operated upon with a view to preservation of the rectal sphincters of these one a man of 80 years died during the post operative period of coronary thrombosis a mortality of 5 per cent. Of the 7 operated up on in the initial series i died of pyelonephritis and oliguria through the injudicious adminis tration of sulfathiazole a mortality of 14 per cent The mortality for both series 2 deaths in 27 patients is 7 4 per cent 1

# ARBITRARY SURGICAL DEFINITION OF DIVISION OF LESIONS OF RECTOSILMOID AND RECTAL AMPULLA

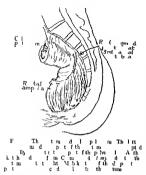
The arbitrary surgical definition of division of lesions of rectosigmoid and rectal ampulla was discussed in the previous report and the problem was resolved by placing the point of division at 10 centimeters from the anus (Fig. Increased experience shows this to be a atisfactory arbitrary divisional point. In resections of the rectosigmoid and rectal am pulla. I have set myself the task of trying to excise routinely a minimum of 3 centimeters of normal mucosa beyond the most distal pal pable margin of the tumor at operation a task easier of accomplishment in lesions of the rec tosigmoid than for cancer of the rectal am pulla In the excised rectal specimen the pathologist not infrequently indicates that the margin of normal mucosa on the distal side of the tumor is less than 3 centimeters. This dif ference is due in part to retraction and short ening following division yet these short seg h we'be don with mo II Ty Luc d h re h how I m II



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ments of normal mucosa beyond the rectal lesion on the excised specimen accompanied by an adequate length of normal mucosa on the proximal side of the tumor indicate some of the difficulties that beset the surgeon in meeting satisfactorily the requirement of ad equate and complete excision of the lesion by ampullary res ction

As stated in the initial report rarely is it necessary in lesions whose lower limit is more than 10 centimeters from the anus to mobilize the rectum extensively posteriorly in order to establish intestinal continuity. On the contrary in lesions below to centimeters regu larly it becomes necessary to mobilize the rectum by division of the middle hemorrhoidal arteries and posterior mobilization to the tip of the coccy v in order to permit of re estab h hment of intestinal continuity by suture Furthermore there appear to have been no pecial problems of wound healing attending resection in lesions whose lower proctoscopic limit was more than 10 centimeters from the anus whereas primary healing occurred only in a minority of the cases in which intestinal union was effected by suture in lesions lying less than 10 centimeters from the anus This



report will concern itself particularly with the experiences gained in this clinic with the problem attending re-ection of low lying lesions re-establishment of intestinal continuity and preservation of sphincteric fun tion

### CAUSES OF POOR WOUND HEALING IN RESECTION OF AMPULLARY RECTAL LESIONS

Granted satisfactory suture primary heal ing is the rule in all resections of the colon and the rectosigmoid. The primary difficulty un doubtedly with the low lying le ions; the vascular factor. That is mobilization of the rectum to the tip of the coccyy accompanied by division of the middle heimortholidal arteries compromise. Sati factory ascularization of the lower segment. Furthermore separation of the rectum from the sacrum leaves a pare posteriorly in which fluid will accumulate un less provision is made for dratuage.

In re ections of the stomach mall intestine or colon the surveon may determine read it by proximity of blood ve sel to the segments to be ana tomosed a well a by the color whether blood flow will be adequate The situat on n low lying rectal lesions with repect to resection 1 not unlike that of total gastrect my done from within the abdomen

As has been indicated elsewhere ga tric resections up to 90, per cent may be done with out special increase of risk, above that assumed in the elective 75 per cent resection performed for ulter (33). When however the stomach is even-ed completely the mobilized esopharia is even-ed completely the mobilized esopharia is deprived of a portion of its blood supply comin from phremic and gastric vessels. Whereas a sati factory suture can be made readily in total astrectomy unless the esoph agopejunal anastomos is covered in the man ner described by me in 10,7 (31) and a in by Craham in 1940 (14) fistitud formation late in convale cence with development of a sub phremic abscess is not insusal

In ampullary resection there is no opportunity to cover the suture line po teriorly. And antenody it is not an ea v matter this item will be referred to again with reference to rectora and fistula. As far as I can know or ascertain by rectal evanination during convalescence after ampullary rectal resection in those instances in which a defect occurred in the suture line the fi tula usually was on the posterior rectal will

# CHOICE OF PROCEDURE IN AMPULIARY RECTAL RESECTION

In the initial report 3 methods of re e tabh hing intestinal continuity were described (i) the Hocheneg, pull through method with Whitehead evin on of the mucosa in the rem using dit als segment () the Hochene g pull throu h method leavin the rectal muco Ain the distal sevement () anastomos of the provimal and distal segment throu h a nonchescope.

In the present series all of these the rewelled have been employed. I have come to feel however that the best method of ree tablishme intestinal union in ampullar, rectail receivous is by the direct sature method made from within the abdomen by the method depicted in Figure 7. Th retur of the 20 fa trents in this series were ope atted upon by the direct sature method. St ange at it may seem after mobilization of the elium anastomo; may be effected by employment of straight changes and a single row if ine sill. Lember satures as close as a centimeters fir in the anno 105 not ly it in not an early a mast moi. I but

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an advanta, e of this method over anastomosis through the proctoscope is that it may be made as a closed anastomosis. It possesses the advantage over the pull through meth od that the provimal segment need not be so long in other words the suture method does not risk necrosis of the provimal segment or retraction as does the Hochenegg pull through method

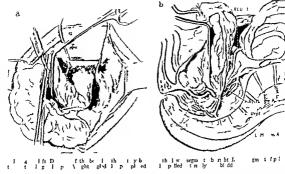
The rectum when empty is not straight as its name implies (1 in 2). There is a deep posterior curve an lat least two lateral curves Not uncommonly therefore when the rectum is mobilized fully the clamp may be applied at the conventional 3 centimeters beyond the lesson permitting resection and anastomosis to be carried out at approximately the same level as the distance which initially separated the amus and the lower limit of the lesson as determined by palpation and proctoscopic examination.

The patients upon whom ampullary rectal resection has been done have been wholly un selected. That is the operation has been done on every patient with carcinoma of the rectal ampulla in whom it was technically feasible to do it. Obviously, in several instances the

operation was undertaken as a palliative procedure in some of these as the experience reported herein will indicate ampullarly resection is not a good operation in that in large circumferential lesions exhibiting local invasion and fivation of the tumor ampullary resection is followed frequently by local recurrence

# TECHNIQUE OF PRIMARY RECTAL

The operation is carried out with the patient in steep Trendelenburg position. Miss Daisy Stilvell medical arti t has prepared the ac companying lucid drawings of the operati e procedure (\(\Gamma\) s 2 to 8) from sketches made alter looking over my shoulder at two such operations They illustrate the technique of the operation far better than I can describe it The details of the operative procedure up to point of applying a clamp to the distal segment are identical with those of the abdomi noperineal operation and const t of the follow ing (1) delineation of peritoneal flaps lateral to the colon (2) 1 olation division and hear ture of superior hemorrhoidal vessel at the sacral promontors (Fig. 3b) (3) division of the



colon and pelvic me ocolon (Fig 4a) (4) mo bilization of the rectum to insure exci ion of 3 entimeters of rectal mucosa beyond the le ion (II 5a b) and application of the clamp on the distal segment (Fig. 61) (2) preparation of the proximal segment for the anastomosis (I'm 6d e) (6) anastomosis with a single row of tine silk Lembert sutures (Fig 7) (7) through a short vertical perincal incision made directly in front of the coccy's the drawing down from the presacral space of a Penrose drain (Fig 8a b) (8) placement of a No 22 rectal tube through the anastomosis (9) ex t aperitonealization of the anastomesi and losure of the pelvic floor (Fig &c d) with su ture of the loser portion of the peritoneal flaps beneath the colon and suture of the late al margins of the colon to the peritoneum again thus effecting double clo-ure of the pelvic floor Great pains are taken to make an effective clo sure of the pelvic floor. The peritoneum is

mobilized adequately to obviate tension and interrupted silk sutures insure frm union Cyclopropane supplemented by periodic small int avenous injections of curare has been the u ual anesthetic agent \ moderately log vertical midline subuml ilical or a para

median rectus incision is employed 1 The wound is closed with interrupted sutures of fine silk

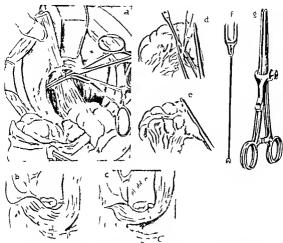
In the earlier cases in which the Hochene pull throu h operation combined with the Whitehead procedure was employed of mol il izing the normal rectal mucosa beyond the le son throu h the anus it became nece sary to operate alternatels from below and above In order to facilitate that procedure the pa tient wa draped on the tabl with the leg flexed somewhat This position created a rather ankward situation particularly for a ri ht handed first ass tant who then found it no essars in the abdominal part f the operation to reach acro the partially flexed right the h of the patient with his r ht hand Mr J hn Phelan of the scientific apparatu shop i the university then built for me a vall and ceili g windlass which permitted the le t be flexed or let down at will Dropping the foot boa d of the operating table permitted acce s to the permeum from below. However the

ab lominal suture method of ampullary resection described herein has made u e of the windle sile simportant

## THE QUESTION OF COLOSTOMY

In colon resections In this clinic antecedent or complemental colostomy hy been reserved with revereption for the patient with acute ob truction of the colon. Many patients with nuld symptoms of colonic obstruction have been treated by an indwelling tube and large doses of mineral oil permitting resertion and primary anastomo is. My associate Dr. Clar ence Denm. (7) has called attention to the hazard of bringing about obstruction by the administration of a barnim enema to patients presenting, threatening signs of obstruction. In this dime routine practice for some time in lessons throw-bout the entire colon including, the r ctoss, mond has been to perform resec-

# SURGIRY GYNECOLOGY AND OBSTETRICS



From The two temps be possible the datal grant that the data grant that the data grant that the transfer of th

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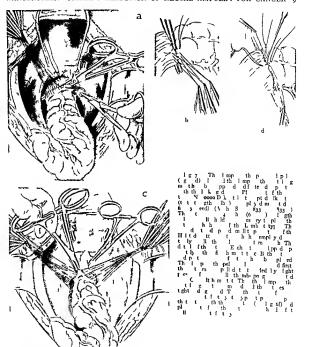
tion and primary anastomo is vithout ante cedent o complemental colostomy. The regularity with which primary union takes place suggests definitely that colostomy is un

necessary

An indwelling duodenal tube is allowed to remain in silu for 4 and occasionally 5 day after operation

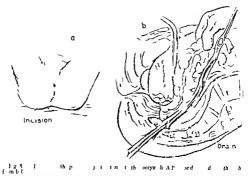
Our experience is that the

indwelling duidenal tube is superior to the Miller Abbott tube in the control of poperative distention. As has been repeatedly pointed out however it i important to employ suction durin the induction of ane thesia and during the operation as well as in the early portoperative period. In other words effective use of the indwelling duidenal tube is the best prophilary a aimst distention. The superiority of the Miller Abb tube in the treatment of acute obstruction of the small intestine or in instances of mill.



colonic obstruction not demanding early oper ation is admitted freely

In ampullar yectal resection however em ployment of complemental colostomy prob ably will be needed in unobstructed cases more frequently than in primary resection of the colon and rectosigmoid. In this series of cases particularly in those operated upon after the Hochenegg pull through plan sup plementary colostomy because of persistent



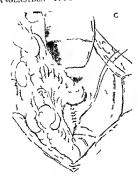
fever became necessary in several patientsowing to retrorectal infection (Fir 9) In the main however our present plan is to try to effect primary anastomo is by a single row of interrupted silk sutur s elongating the peri toneal cul de sac by suturin the peritoneal flaps beneath the colon and draining the resid ual presacral space through a small incision in front of the coccyx (Fig. 10) Whereas as has been indicated a temporary fistula occurred in the larger number of these cases primary healing without evidence of fistula took place in 4 of 13 patients operated upon by the pri mary intra abdominal suture method. In of the 13 patients in this group a supplemental colostomy was made because of the occur rence of a rectovamnal fistula Slight eleva tion of temperature ordinarily herald the rence of a leak in the suture line Often

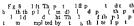
systemic reaction. Some fecal matally comes away through the drain fit. The inius is impatted is nor three times a day. When the patient becomes afel into or when it is clear that the leak in the suture line has occasioned no untoward symptom the drain 1 withdrawn. In a few day, the external in thu is opening closs spontane.

ously and the small retrorectal abscess cavity becomes obliterated and the defect in the rec tal wall beal The \0 22 rectal tube thread d past the anastomo 1 at the time of operation alloy ed to remain in place for nearly a week a day after operation it is withdrawn a centi meter to obviate the possibility of the tip of the tube pressin upon the wall of the pelvic Three days colon causing pres ure necrosi later the tube 1 withdrawn In re ections of the terminal pelvic colon in which the rectum not mobilized posteriorly no attempt or dinarify 1 made at operation to pass a rectal tube beyond the anastomosis for too often east entry of the tip of the tube into the pel ac colon 1 prevented by Hou ton s valve

#### SULFOXAMIDES UNVECESSARY

As as indicated in the earlier report the only preoperative preparation of the col and rectum employed in this clinic is the properation administration of enemas preceded to the 1 beard of a diaministration of mineral of 1 its an empty bowel that is desired it has not been our practice to employ succensisulfathuzzole in colonic or rectal size rey. We see et the 1 cal implantation of mall





amounts of sulfathuazole referred to in the cather report has been abandoned. In tho e instances in which a urethral catheter is employed small daily doses of sulfadhazine ure gi en in the early postoperative period to thwart urinary tract infection.

#### DIETARY MANAGEMENT

All patients are fed a high protein and car bohydrate and low fat diet for a few days prior to operation. In patients who have lost considerable weight the preoperative dietary preparation must be long enough to permit the lipotropi action of such a diet to rid the liner of its exces fat—for patients with fatty liver stand operation poorly. The details of this management have been described el e Pere ( 0 , 3 , 33)

THE OCCURRENCE OF RECTOVAGINAL FISTULA

We have learned that dramage through the vagina is inadvisable in any of the methods of ampullary rectal resection. If perirectal suppuration occurs a persistent rectovaginal fistula may follow. Moreover a pontaneous



apt the defth be lith at the deliber of the period to the term of the period to the deliber of the the del

rectovaginal fistula has 1 en ol served twice without drainage of the vagina My colleague Dr John L McKelvey (17) professor of obstetrics and gynecology (1944) informs me this occurrence is probably owing to the de pendence of the posterior vaginal wall on the blood flow from the middle hemorrhoidal ar teries which are divided regularly in the opera tion of rectal resection an expression which finds confirmation in the anatomical observations of Quenu ( 4 1893) The distribution of the branches of the middle hemorrhoidal arteries is principally upon the anterior wall of the rectum above the l vatores while the branches of the inferior hemorrhoidal arteries are dispersed largely upon the posterior wall below the levatores (Cunningham) There is no marginal artery of the rectum as in the As the three hemorrhoidal arteries reach the rectal wall they break up into branches which are distributed over and through the rectal wall

Lately in adherent lesions in the female I have excited the uterus and the upper portion of the vagina coincident to reletablishing



intestinal union in ampullars resection thu insuring better removal of the tumor and avoiding, simultaneously the hazard of a recovaginal fittula. In a recent cale after such a procedure primary union occurred the suture line being a centimeters from the anu. (Fi. 10)

### ARTERIES OF THE RECTUM

Stevard and Rankin (1923) g c ag od ac count of our available knowled eon the blood supply of the lot er colon and rectum. Quenu (803) and D ummond (0 41) have both stressed the inconstancy of well developed anastomo me vessel between the middle hemorrhoidal and the supe for hemo ho dal arteries above the le at oe so on the one hand and between branches of the middle hemorrhoidal and branche coming f om the after on the other The latter communication i even more feeble than the former



F Draw sit p tom it or ye mp il ectal esect by t H h or i th t tmporary h t i th ta (T bi H Ca a)

In one of , di ections Quenu fa led to demonstrate any communication between branches of the superior and middle hemor rhoudal arteries on the rectal wall in the remaining the communication was unialeral and not with mosculating branches on both sides of the rectum as one min ht expect. Drummond believes the middle hemorrhoudal arter to be an unconstant vessel masmuch as the was able to demonst after its pre ence employing the xiax inject on technique only times in I pecimens His kiagrams empha use the importance of the superior hemo-thoudal arter, no vascula usure the rectum

Q enu state that the middle sa ral arters or es off usualls three small branches at the level of the la t sacral's rebra to the p ste sor a pct of the rectum Pope and Bue (90) describe a rtr ectal pleau to with mall branche of the middle sa ral arters supply more tast commodent

The supe or hemorh idal 1 the he fartery of the rectum and ina much as the pa ed m ddle and infer hemo hold I ar tere are artable and incon tain it is nder standable that attend ag divi ion of the su per or and m ddle hemorholdal artenes ampullary rectal re-ection difficultivith wound healing and temporary ectal institution are not uncommon. It has been pointed out

previously that Sudeck's (1907) critical point has no importance in excision of the colon pelvinum and the upper rectum ahly only in the pull through operation is Sudeck's critical point really important. In that procedure as has been pointed out the proximal pelvic colon must be several centi meters longer than is necessary in ampullary resection by the primary suture method Whereas the howel is usually long enough the primary difficulty with the pull through maneuver relates to the shortness of the vessels in the mesentery despite all efforts at length ening them. If the sigmoid ima arters is cut the marginal vessels along the me enteric bor der of the colon may be madequate to vascu larize it. In consequence necrosis and retrac tion of the segment drawn down through the anus may occur. As in ampullary rectal resection the superior hemorrhoidal arters is divided also in rectosi, moid resections how ever in the latter operation, the communica tions between the terminal branches of the superior hemorrhoidal and the middle hemor rho dal on the rectal wall are not disturbed and difficulty with wound healing does not oecur.

## AMPULLARY RESECTION FOR ULCERATIVE COLITIS

Three of the 27 patients in whom ampullary re e tion was done had ulcerative colitis. The remaining 24 had cancer of the rectum. In 1 of the 3 patients with ulcerative coliti there was a localized lesion extending from 9 to 14 centimeters from the re turn permitting am pullary resection with anastomosis to the troumal portion of the pelvic colon in an other the whole colon was involved and a rec tal stricture was present to centimeters from the anus (Fig. 11 specimen 8) in this instance the end of the sleum was sutured to the ter minal rectum. In the third patient referred to in the initial report the whole colon and rec tum were involved necessitating complete excision of both the problem being resolved by pulling the ileum down through the exter nal sphincter after the Hockenegg pull through method accompanied by White head excision of the rectal mucosa from the di tal segment. Primary healing did not occur

m any of these 3 patients <sup>1</sup> Rectal function has been quite satisfactory in the first patients. As was indicated in the first report in the in stance of the patient with complete colectomy and protectomy recourse had to be had to a secondary eleostomy. This patient can retain 4 ounces of water administered by a rectal tubefor ap node of Simules without too great difficulty and the prospect of again re estib hishing intestinal continuity appears not in tilely. If the Whitehead evension of mucosa from the distal segment had not been employed the prospect of satisfactory rectal function in this patient undoubtedly would be even better.

Sphineteric function Ampullary resection was undertaken in 27 patients of these 2 died in hospital. In 2 of the remaining 5 patients surviving ampullary resection in whom a supplemental colostomy became necessary opportunity was afforded to test sphincteric function one of these Mrs M R Univ Hosp No 743136 aged 68 years had hepatic metastases and a growth adherent to the cer vix and posterior vaginal wall. A local recur rence precluded secondary closure of the colostomy and excision of the two henatic nodules Additional experience has suggested the advantage of excising the uterus and the upper portion of the vagina in such patients The other patient Mrs P P Iniv Hosp No 746541 aged 68 years developed evidence of a pyelonephritis alter leaving hospital and died 2 months after operation of a pulmon ary embolus. The predisposition of patients having colostomy to development of urinary

tract infection appears to be nell established Of the remaining patients sphincteric function appears to be satisfactory in the majority. All the patients in the group have been followed and observed from time to time. In order that patients might not be persuaded to give more favorable replies at the time of examination than the situation warrants the following inquiry was sent to all patients have might have been followed ampullary resection.

I Is the rectal control satisfactory?

2 Are there periods when the control is not satisfactory?

TABLE II -- RESULTS IN 27 PATIFATS UNDERGOING AMPULLARA RECTAL RESECTION

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TABLE II - RESULTS IN 27 PATIENTS UNDERGOING AMPULLARY RECTAL RESUCTION-C t d

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3 Do you find it necessary to wear a diaper or take other precautions against soiling?

Can you control gas?

5 Has your activity been limited in any way by the operation on the rectum?

The replies to this questionnaire tallied quite closely with our own evaluation and the results appear in Table II The patients with excellent or normal sphincteric function all had ampullary rectal resection by the suture method. The same set of questions was submitted to the nationts who had undergone resection for carcinoma of the rectosi moid Uniformly the sphincteric function of that

group seemed to be normal The preservation of normal or nearly nor mal sphincteric function in the majority of the patients undergoing ampullary rectal resection has been very gratifying Inpatients in whom a rectal fistula developing fro a leak in the suture line was slow in healed with a persistent defect 1 the rectal wall rectal continence has been impaired Moreover a rectova anal fistula has marred an otherwi e satisfactory continence in 2 patients Equally or even more important than local causes in disturbing sphincteric function have

been mental changes owing to senility tients who have undergone ampullary resec tion must be more alert to the necessity of exacuating the lower bowel than the patient with an intact rectum

Babcock (1932) removes the sphincters and establishes a perineal anus in doin the radi cal operation for rectal cancer ( ) Babcock and Bacon (1942) assert (3) that the phine terless perineal colostomy is to be preferred to the abdominal colostomy Whereas for sentimental reasons the perineum may appear to be a more desirable location for an artificial anus it would seem better to have such a colostomy opening where it may come more directly under the watchful eye of its owner

Preservation of sex function in males Loss of sex function or impotence in males after the abdominoperineal operation 1 well k Apparently in patients undergoin ampullary rectal resection as in patients has ng had ex a ion of the rectosiomoid there appears to be little or no impa rment of the function

# LOCAL RECURRENCE

Of the 27 patients in whom ampullary re section was done in , the operation was un ler taken for ulcerative colitis the remaining 24 had cancer of the rectum Two of these failed to survive operation Of the 22 patients sur viving ampullary resection for rectal cancer , had evinced evidence of local recurrence In 4 of these ampullary resection was under taken as a palliative procedure Yet even in these patients the abdominoperineal opera tion would have given better assurance against local recurrence This matter of local recur rence in large fixed lesions has been the most disappointing experience in this effort directed at preserving sphincteric function in ampul lary resection. Two of these a patients had hepatic metastases at the time of operation One of these Mrs MR Unix Hosp No 743136 was mentioned under the discussion of the complication of rectovaginal fistula. In one patient the large fixed resected lesion proved to be a gelatinous carcinoma An abdominopetineal operation was done subse quently but the lesion has recurred again Viles (1931) state (19) that such gelatinous carcinomas as well as melanotic lesions are not curable by any known means Broders Buic and Laird (1940) and Norbury (1941) while allowing that colloid cancers are usually high ly mali nant are not as pessimistic over them as Miles Dukes (1940) places all colloid or mucoid cancers in a separate and distinct roup (11) All 3 of the patients in whom re currence developed in this series had large fixed low lying lesions which had penetrated the fascia propria of the rectum presenting at the same time meta tatic lymph nodes in the pelvic mesocolon The first ampullary resec tions reported herein were done in 1942 in other words even the first patients in the group were done less than 3 years ago The elapse of additional years obviously will be required before one can evaluate the factor of lon, term survival

Gilchrist and David (1638) study, ing cleared pecumens excised in the abdomino permeal operation for rectal carcinoma found mitastatic lymph node in 68 per cent of the cases Coller and his associates (1934) in 64 per cent and Gabriel and his associates (1933) observed hymph node melistatese in 62 per cent of dissected pecumins Gilchrist and David con cluded that large tumors may have no lymph cluded that large tumors may have no lymph

node metastases whereas small tumors may occasionally present evidence of extensive lymphatic spread. They point out further that when there is gross involvement of high lymph nodes there may be retrograde metas tases to lymph nodes lying below the tumor.

Whereas Coller and his associates (1040) failed to find evidence of lateral lymphatic spread in lesions lying more than 3 centimeters above the anorectal line I am convinced from the experience with low lying fixed lesions that an operation which does not excise the levator muscles in juxtaposition to the bowel invites local recurrence. In the , instances reported herein in which local recurrence fol lowed ampullary resection the local invasive qualities of the tumor may have been respon sible Yet I believe it would be safer to sug gest that ampullary resection in such instances can be indicted on the score of failing to re move the lateral zone of lymphatic spread as well as in its failure to deal adequately with the item of local invasion Miles (1031) states that the levator ani muscles are especially prone to invasion by cancer cells which have gained access to the extramural lymphatic system of the rectum (20)

The primary defect in the perineal operation for rectal cancer apart from the loss of sphincter function is that it fails to deal with the upward zone of spread The potential de fect in ampullary resection for rectal cancer is that when applied to unsuitable cases pa tients with large low lying lesions it fails to deal with the item of lateral lymphatic ex tension via the fascia overlying the levator muscles further it compromises somewhat on the extent of excu ion of the rectal wall distal to the lesson From the standpoint of cure of rectal cancer obviously the abdominoperineal operation is the best procedure. In how many instances however would ampullary resection protect equally as well against recurrence and at the same time save the patient s sphincter? Many surgeons latterly are com mg to the point of view in the management of cancer of the esophagus if esophagogastric of esophagojejunal anastomosis can not be effect ed that the patient should not be subjected to the alternative procedure of the Torek operation with establishment of an external fistula. In exteriorized esophagus is a severe handicap contrasted with the lesser troubles of a colostom. Nevertheless it is perhap not out of place to point out that surgeons can make but a poor imitation of the rectal sphine ters which nature bountifully bestoned on us neither can one be bought at any price in any market open or dark.

I number of studies indicate that approve mately 50 per cent of unselected nationts subjected to the abdominoperineal operation sur vive , years without recurrence Jones (15 1929) 47 8 per cent Lemberton and Dixon ( -1934) 35 8 per cent (includes all opera tions for cancer of the rectum) Abel (1935) 58 5 per cent Jones (16-1936) 52 6 per cent for the one stage and 51 3 per cent for the two stage abdominoperineal operation. It is rea sonable to infer that the lo ses by death from recurrence of the malignant growth are sus tained largely in the group exhibiting local invasion and lymph node metastases (Dukes group C) In other word even the best and most radical operation i madequate for a large number of such cases Dixon (1944) in forms me that in a series of 100 patients with rectal cancer operated upon more than a vears previously there were no 3 year survival among patients who e lesion fell into Dukes group C Similarly in a small series also re ported from the Mayo Clinic by Seefeld (1942) there were no , year survivals in patient whose lesions were placed in Broders group Among 191 patients whose exer ed lesions were classified in Dukes roup C Broder Buse and Laird (1040) found only 146 per cent of 3 year sure is al and among 18 patients whose lesions were placed in Broder g oup IV they observed only 11 1 per cent 5 year survivors In this connection Mile (o-103 ) the innovator of the abdominoperineal operation said concerning it Sho ild it be rese ved for advanced cases only a dvocated by some then the invisible spread will have advanced beyond the confines of the operation neld and recurrence will be inevitable (11) It would be difficult to justify any ope ation for can er on the basis of ac omplishment in the late case

In the study Dukes (o —193 1940) well known scheme of classyring rectal tumor has been employed. It is my impression that Dukes scheme may not be as useful to the surgeon as it is to the pathologist for it implies that metasta es do not occur unless local myasion has ocurred. It would be more in keeping with surgical experience to indicate that any malignant tumor with or without local invasion beyond the confines of the rectum may be accompanied by lymph node metastases, even though the incidence mounts sharply when the primary tumor exhibits definite exidence of local inva jon

#### HEI ATIC METASTASES

The occurrence of hepatic metastases indicates definitely that va cular embolism of tumor cell occurs in malignancy. Coller and his associates (1940) noted evidence of direct local invasion of venous channel in 15 per cent of the rectal specimen studied.

Coincidental partial hepatectomy for direct exten ion of a mali nant growth into the liver at the time of gastric resection for cancer has been de cribed previously (3.) A more pro tracted period of ob ervation of the patients in which that procedure was carried out confirms the validity of the worthwhileness of such a maneuver Because of the len th of survi al of many patients undergoing primary resec tion of the colon for cancer pre enting hepatic metastases at the time of operation I sug se ted previou ly that secondary ever on of henauc meta tases rea onably mi ht be u der taken in such case It 1 only 1thin the past year bowever that I have been able to per uade patient to under o uch secondary re section If protracted followup in such pa tients should indicate that survival is no greater than in a similar gro p in which the metastases are left one might yet learn some thin of the manner of rowth of hepatic My the 1 1 that fat the fist metastasc operation the local lesion and the lymphat drama e area can be exciled atisfactor ly secondary excusion of the hepatic metastases 6 to 8 weeks late may cure the le n Failure to palrate meta tase not nea the surface in an or an as thick as the ri ht lobe of the liver admitted freely

Hemostasi i not a difficult p oblem in e

fibrous tissue in the liver that bleeding may be controlled readily The cautery is employed to remove the section of the liver involved Large vessels are seized with hemostats as they are encountered and the vessels are ligated In a deep wound the vessels in the liver substance can be distinguished readily by palpation that is the hepatic substance may be readily compressed between thumb and lorefinger disrupting the tissue continu ity leaving the ve sel intact Fibrin foam (Cohn) has been a helpful adjuvant agent in the control of parenchymatous oozing When the vessels which traver e the defect in the liver are ligated ho vever ordinarily the prob lem of hemostasis is not particularly difficult The adjacent ed s are sutured if possible with a running suture of catgut and the trans verse me ocolon or other available omental structure is employed to sew over the defect with the thou ht in mind of localizing the in cvitable temporary bile fistula dramas, 1 th refore ilways provided and temporary external drainage of bile is usual

Du mg the past year three such secondary excisions of metasta es have been undertaken Two of these secondary partial hepatectomies were done for rectal malignancy in which an antecedent ampullary resection was done and one in a patient who developed a local recurrence following an exteriorization of era tion done elsewhere for a carrinoma of the pelvic colon. Six weeks after simultaneous removal of the colostomy the local recurrence in the abdominal wall and performance of primary anastomosis metastases were excised from both lobes of the liver (Fig 1 specimen C) In one of the rectal cases the metastasi was large and single involving the lateral por tion of the right lobe of the liver The gall bladder was freed and deflected to the left The excisc I liver tissue weighed 332 grams (1 pr 1 specimens A and B) These two pa tients continue well. In the other patient, two metastases were present in the right lobe of the liver. This patient al o had a large fixed neumierential le ion that wa removed with difficulty the Hochenig pull through op tration being done Supplemental colostomy be ame necessary becau e of fever and pun rectal surpuration I few weeks later the

colostomy was clesed and the hepatic metas tases were excised at the same time. The rectal function was quite satisfactor. A fee months later however evidence of local recurrence became apparent. This patient died of local recurrence involving both urcters somewhat move than to months after ampullary resection. Two hepatic metastases were again present in the right lobe of the hire at autops. Whether these final hepatic metastases were the result of inadequate removal of the initial hepatic metastases salver the result of inadequate removal of the initial subsurface meta ta es or failure to remove the Lad lesson completely, cannot be determined.

AMPULLARY RESECTION COMBINED WITH RE MOVAL OF METASTATIC LYMIN MODES PROVINAL TO THE FELVIC MESOCOLON

Mention has already been made of stances in which resection of the whole colon and the greater portion of the rectum was made for ulcerative coliti. In a patient Mr. J C Univ Hosp No 744810 and 33 with carcinoma of the rectal ampulla presenting lymph node involvement proximal to the pelvic mesocolon following excision of these nodes and the inferior mesenteric artery at its site of origin from the aorta it became evident that the left colon was not adequately vascu larized through the midcolic artery and the marginal branche of the left colic artery. In consequence it became necessary to mobilize the entire colon up to and including the hepatic flexure (Fig 11 specimen 7). The left halt of the transverse colon was finally anastomo ed to the rectum. If the transverse colon had not been so long it might have been nece ary to anastomose the cecum to the rectum This patient has satisfactory sphine teric function. In the earlier report, it was in dicated that the terminal ileum or the cecum had been anastomosed to the terminal pelvic colon in 7 patients without mortality

INDICATIONS AND CONTRAINDICATIONS TO EMPLOYMENT OF AMPLITARY RESECTION

It is to be admitted freely that this operation cannot compete in all cases of rectal cancer with the abdominoperineal operation. It immediately apparent that its employment is contraindicated in juxtasphincteric malig







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nances on the score of inadequate removal of the local lesion furthermore in all lesions at the level of the lesitor muscles the operation is contraindicated on the score that this procedure doe not permit division of the leviator muscles and adequate removal of the lateral zones of lymbatic spread.

Hence in all large fixed ampullars lesions in which the tumor has extended beyond the confines of the fascia propria of the rectum and a real opportunity for spread into the lat eral lymphatic zone eu ts ampullari resic tion should not be undertaken. In other words in instances in which there i real haz ard of local recurrence the abdominoperineal operation should be favored over ampullary resection Apart from these considerations the operation of ampullary rectal resection described herein would appear to deal as well with the problem of rectal cancer as does the abdominoperineal operation. The avenues for upvard lymphatic extension of malignant growth into the pelvic mesocolon can be dealt with equally as well by the operation of am pullary resection as by the abdominoperincal operation

DISCUSSION

The following are the items which concern both patient an I surgeon in this and any other operation for mah rancy (1) operative mortality (2) possible complications of operation (3) pro pects of ultimate cure (4) function

I reservation of sphincteric function 1 the pecial consideration which compels interest

in ampullary resection. The operation appeals at once to the patient The thought of a colos tomy is ordinarily abhorrent and frequently revolting to a patient. Mere mention of a possibility of saving the sphincters immedi ately arrests the patient 5 interest | There are patients who will not accept a colostomy There were a few such patients in this group Let 2 such patients when evidence of local recurrence developed following ampullary re section for fixed circumferential lesion will in ly accepted colostomy and subsequent efforts directed at extirpating the recurrence All surgeons have had experience with patients who will not submit to operation if told they have cancer Obviously they are unreason able but this type of mania sometimes defies being set aside An operation which must be defended on the thesis that it may be a satis factors substitute for patients who are more interested in preservation of function than in cure is obviously not a good operation for

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There are patients for whom a colostomy is a heavy and trages burden. The majority of reasonable patients however learn to deal with the situation and tolerate colostomy without complaint. It is probably fair to say however that it is far easier to advise accept ance of colostomy than it is for the patient to resign him eff to it. Only once has a patient hunted and threatened me with a gun. That patient had a colostomy performed in this clime because of acute obstruction caused by

an irremovable mahonant lesion in the left colon. He demanded that the colostomy be closed. I thought he was unrea onable, he thought we were becau e we failed to comply with his wishes.

It is to be admitted that postoperative complications are more frequent in patients undergoing ampullary resection than in the c accepting the abdominoperineal operation 1 defect in the suture line with a temporary retrorectal fistula 1 a rather common compli cation. The length of the postoperative hospi tal stay in this group of patients has been long made so e sentially by nece its for supple mental colostomy in a number of the patients In the earlier series reported the average po toperative hospital stay for primary resection of the colon and rectosigmoid 1 as 12 3 That figure has not been computed for the 78 colon resections reported herein but it 1 undoubtedly shorter because the majority of patients having re-ections of the colon through oblique or transverse inci ion are now leaving hospital before the tenth post operative day. A trying complication in a few in tances of ampullary resection ha been a rectovaginal fi tula in the female. I have the impression however that more frequent coincident excision of the uterus and the upper portion of the vaging in the in tance of adher ent tumors will eliminate the hazard Under no circumstances should drainage be estab lished through the vagina in ampullary rectal resection

Despite the complication of a temporary retrorectal installa which has been dealt urth in the majority of mo e recent cases olely by pro 1 ton for perineal drainage just anterior to the coccy x I ha e the impression that am pullary resection can be done at n ks not far out of line with tho e run by pair ints indergoing the abdomnoperineal operation

Time will indicate whether the ultimate results of this operation evaluated on the score of 5 year or longer period of survival without evidence of recu rence are as good in property selected cases as in the more rad cal abdomin operineal operation. I abetterprocedue for loving lesions and part cultarly in laye fixed circumfe entitle loving, le ion in which the

opportunity for lateral lymphatic spread of the tumor is great already has been admitted

Perhaps in no type of cancer would effort at instruction of the public in the early reco nition of the symptoms of rectal cancer prove more helpful Were it not for the confusion of bleeding hemorrhoid every patient with rectal bleeding should come for examination to have the diagnosis of rectal cancer di prove I Much more can still be done to in struct the public on thi score Granted early dia nosi a lar larger number of patient could have ampullary r section with sphincter preservation rather than the abdominopen neal operation and colo toms. In a study of 1 401 case of cancer of the rectum and recto sigmoid Bacon (1958) in reviewing the loca tion of 1 101 carcinoma in the pelvic colon and rectum tated the distribution to be a follows sigmoid 2 5 per cent recto i moid 16 per cent rectum 36 r per cent and anal canal 4 9 per cent Only 19 1 per cent of these 1 to neoplasms were less than inche from the anorectal line Dividing the rectum into three parts of which the lovest 1 the shorte t and the upper the longest portion Duke (1040) found in a group of 915 rectal cancers ,6 6 per cent in the lower third , 6 per cent in the middle and 30 8 per cent in the upper third Inasmuch a moullary resection can be carried out in the midrectum quite regu larly and as lov as centimeters from the anu particularly in thin in suitable instance women with a deep cul de sac in instance of rectal carcinoma diamosed early the method would appear to have a vide ran e of appli cability In the class ampulla y resection ha reduced materially the number of abdominoperineal operations however a has been indicated ve al eady have lea ned that the method has no place a low lym les on in juxtapo ition to the le atores and part cu la h m lar e tix d los hang lesions

# COMBINED BARIUM AND PROCTO COPIC

An item not to be forgotten in all colonic and rectal operations for malemant grov the is that exci ion of an extra se ment of bowel occa ionally brin with it an unexpected pol p In this clinic therefore all patients in

## SUMMARY

Primary resection employing the closed anastomo is without ante edent complemen tal or supplemental colostomy t used in this clinic as the operation of choice in all unob structed malignant growths of the colon Similarly in suitable lesions in the ampulla of the rectum primary resection (closed anasto mosis) can be carried out satisfactorily Whereas primary healing and in consequence short postoperative hospital stays are the rule in primary resiction of the colon and recto sigmoid in ampullary rectal resiction pri mary healing is not usual. This circumstance is owing to the sole dependence of the sur viving lower rectal segment upon the inferior hem irrhoidal arteries following division of the superior and middle hemorrhoidal vessels and mobilization of the rectum which ordi namly deprives the lower rectal segment of the branches coming from the middle sacral artery as will nevertheless amoullary rectal resection with primary an istomosis usually can be done without colostomy provision being made for permeal drainage of the presacral space whi h may become infected because of a de fect in the suture line Supplemental colos tims h wever has been necessars in several instances to deal quickly and more effectively with the item of posterior space infection

The chief defect in the operation of ampullater recection is that it is not a good operation for large fixed low lying Dukes group C main nant growths. Whereas the tumor can

be mobilized und a satisfactory anastomosis made even in such cases the opportunity for local recurrence is great in that the operation does not remove the levator muscles and the lateral zones of lymphatic spread. In suitable small low lying lesions and in most lesions of the upper rectum. This experience with rectal resection suggests that it is a sitisfactory operation for cancer. Ampullary resection also has been done for ulcerative colitis.

Sphincteric function in most cases has been good after ampullary resection. The primary closed suture method appears to be the most satisfactory operation.

The hospital mortality for primary resection of the colon and rectosigmoid has been 5 per cent and for ampullary rectal resection 7.4 per cent

Secondary excuson of hepatic metastases is described

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# METABOLIC ALTERATIONS FOLLOWING THERMAL BURNS

# II Changes in the Plasma Volume and Plasma Protein in the Convalescent Phase

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HE purpose of this paper is to present the alterations that occurred in the plasma volume the available (this cyanate) fluid volumes the total plasma protein the total circulating plasma protein the total circulating albumin and the hematocrit value of himsed does during the convalescent period. It has been shown (8 16) that during the first 36 to 48 hours after burning there is a duminition in the plasma volume. Because of this diminution and because of the questionable accuracy of plasma volume determinations during shock the present studies were con fined to animals that bad fully recovered from the immediate shock, plases.

### MATERIALS AND METHODS

Normal adult female mongrel dog were employed. The dietary management and the preparation of the animals are described in another publication (4) (Animal 7 and 8 were simulfaneously employed in both studies). Control blood studies were obtained after the animals had been maintained on a con tant diet flor n3 to 4 weeks. Following the burn all of the animals evecpt dog 9 were able to continue on the same detail.

All blood samples were obtained in the morn ing after a 1 to 18 hour fast. Hyparin was used as the anticoagulant. Undue stasis was avoided and greased syringes were employed to prevent hemolysis. Hematocritis were done in duplicate in Sanford Magath (7) cell volume tubes the total plasma protun concentration was done in duplicate by the micro oncentration was done in duplicate by the micro concentration was done in duplicate by the micro concentration was determined by the method action of the control of the co

cated by Hill and Trevarrow except that five times the amount of plasma and globulin pre cipitant was employed

The plasma volume and available (thio cyanate) fluid volume were determined by injecting simultaneously 868 milligrams of Evans blue dye (T 1824) and 483 milligrams of sodium thiocyanate according to the direct method of Gregersen and Stewart as adopted to the photoelectric colorimeter by Gibson and Evelyn The disappearance slope of the Evans blue dye was determined by four points and was found to vary only slightly during the control or positburn studies

The total circulating plasma protein and plasma albumin were calculated by multiply og the plasma volume by the plasma protein and the albumin concentrations per cubic cen timeter respectively. The total blood volume was calculated from the following for multa.

Since it is generally appreciated that the true blood volume cannot be determined in this manner (14) no absolute conclusions will be based on these findings but it was thought that the percentage changes might be of seminterest because of the alterations that occurred in the plasma volume and in the hematocrit

A few days after the control blood studies had been obtained the ...nimals were burned under intravenous nembutal anesthesia. They were burned over the thorax and abdorren which had previously been shaved. Irons with a hurning area of 12 57 square centimeters were employed being heated in boiling

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hydration Shen Ham and Fleming have shown that anemia is present in the convalescent phase of burns because of an acceler ated breakdown of red cells due to an increa ed fraghity

Our data also show a definite diminution in the red cell mass. Whether this is entirely due to an increased breakdown of red cells or in part a result of the crowding out of red blood cells by the increased plasma volume is not definitely known Conversely we are unable to say whether the increase in the plasma vol ume is due to an attempt to compensate for the decrease in red cells or whether it is caused in part by retention of flind and electrolyte Peters and Van Slyke and Warren Mernil and Stead have stated that often a compen satory ri e in the plasma volume occurs when anemia is present but since there is disagree ment on this point (3) the anemia seen in our burned animals may not be the sole explana tion for the rise in the plasma volume

Although the plasma volume was increased in most instances there was interestinally a decrease in the total circulating plasma albumin which accounts for the major o motic pressure of the protein fraction cently stated that an increased plasma vol ume apparently occur 4 to 5 days after a hurn and intimates that this may be due to the reabsorption of previously lo t protein That the rise in plasma volume is not due solely to the reabsorbed protein seems likely. In dog o the amount of total circulating protein and albumin was markedly increased when the volume showed a precipitou fall. Also the fact that the rise in the plasma volume per sists for weeks makes this theory unlikely Thus the increase in the plasma volume must be largely due to a retention of either water or electrolytes or both

Because of the findings in the present study and because of the increasing tendency to employ electrolyte solutions in the treatment of shock (2 11 5) it seems worth recon dering the factors that influence the se of the plasma volume. In the normal individual it has been shown (17 18) that the osmot c effect of the potent fraction is extremely important. The osmotic pressure exerted by the proteins e peculially albumin s larvely responsible for the

reabsorption of water into the vascular sys In the healthy subject the protein i almost entirely confined to the va cular bel and to the intracellular space and there: approximate osmotic equality of the electrolytes within the cell the interstitial space and the plasma Thus a slightly hi her solute con centration within the plasma and intracellular phase is maintained because of the presence of the protein molecules It should be re membered however that the electrolytes are present in much greater amounts than i protern and since the amount of water pre entire the body compartments is dependent on the total solute concentration (colloid and electrolytes) the electrolytes are much more in portant than are the colloid in determinin the total amount of body water (20) In fact it has been stated by Van Slyke that the osmotic effect of the protein molecules 1 so slight when one is considerin total body water that it can be almost ne lected. It seems probable therefore that the altera tions noted during the convale cent phase of these burned animal is lar ely governed by the fluid and electrolyte disturbances

From other experiments (22 32 33) it is also evident that the size of the plasma volume in the diseased state is often not dependent on the plasma prote in concentration. It should be recalled that the intrapertional injection of a solution of 5 per cent devices into normal does with the withdrawal of the same amount of fluid 4/ hours later produces a marked increase in the plasma protein concentration but the even in the face of an adequate water and caloric intake will not re tore the plasma volume if sufficient electrolyte are not p e-ent (2)

The importance of sodium was re ently emphasized by Fine Frank and Seleman who showed that the intravenous administration of a percent solution of albumin into animal suffe ing from touriquet shock was not of benefit unle s a physiologic solution of sodium chloride was given by stomach tube or intravenou if

The work of Warren Merrill and Stead (3) ha also shown that a normal plasma volume may be obtained in shocked animal even when the protein concentration and total

circulating plasma protein is markedly dimin ished by increasing the extracellular fluid vol ume (tissue tension) Thus it is evident that the size of the plasma volume in disease is not dependent on the protein concentration alone but is governed by the following factors (1) the total solute concentration of the extra cellular fluid volume and the available water (2) the osmotic pressure of the plasma minus the osmotic pressure of the interstitual fluid and (3) the blood filtration pres ure minus tissue tension Coller Campbell Vaughan Iob and Moyer have pointed out that at cer tain times the kidneys are unable to excrete electrolytes and water in normal amounts and that the inability to excrete such products may lead to a marked retention of body fluid when the circulatory mechanisms aforementioned are not grossly abnormal

Studies by Davidson on patients with severe burns showed that chloride was excreted in only small amounts McIver re emphasized this fact after having administered large amounts of a physiologic solution of sodium chloride Trusler Egbert and Williams stressed the undesirable effects of large vol umes of water in burned patients and experi mentally were able to produce water intoxi cation by exces ive administration. It has al o been shown that a fall in the extracellular sodium concentration (g 23) causes an intra cellular shift of water and since this condition and acidosis often exist during the shock and convalescent phases of a severe burn at would not seem desirable to give large quantities of water nor a physiological solution of sodium chloride Solutions with an electrolyte make up similar to that of plasma that would not upset the body's normal electrolyte pattern and would combat alterations in the acid base balance would thus appear to be desirable during the period of shock. In the immediate postshock phase it would then seem advisable to give solutions and food that would have the mineral and food value needed especially for cellular repair and that at the same time would gradually help rid the body of any excess water

# CONCLUSIONS

1 Following the shock phase burned am mals that were maintained on an intake of

food identical with that consumed before in jury show a decided rise in their plasma volumes above the normal

2 Since a state of overhydration is manifested during the convalescent phase by the increase in the plasma volume and available (thiocyanate) fluid volume per kilogram of body weight it does not seem advisable to give excessive quantities of fluid during the postsbock period. Such an overaccumulation of fluid may undoubtedly lead to some of the so called toxemic deaths. Adequate urinary output should be maintained and duresis en couraged.

3 A marked increase in the total circulating plasma proteins was present although a marked negative nitrosen balance existed for 2 to 3 weeks

4 A moderate decrease in the plasma albumin concentration and in the total circulating albumin occurred when the plasma volume increased

5 A definite anemia was present in the con valescent phase becau e of an actual decrease in the circulating red cell mass

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were in the patients with the most deficient proteins. They found that high calonic intake if low in protein had no effect on the healing of bed sores there was continual weight loss and introgen balance remained negative. On the other hand a high protein diet resulted in a positive nitrogen balance and rapid healing of the ulcer At this time I had a patient with a decubitus wher 4 centimeters in diameter which was enlarging in spite of very good dursing care. This man was then placed on a high protein diet (too to 150 gm protein per day) and in 12 days the ulcer was healed

Distention and gas pains may be prevented or greatly lessend by the administration of adequate protein. In 1977 Mecray Barden and Ravdin experimenting on animals noted that as securin proteins decreased in concentration gastric emptying time was delayed Ravdin found that with marked hypoprotinemia it took three times as lone for the food to pass throu h the stomach and the small boxel.

An important function of the plasma protense specially of the albumin is to control the balance of fluid between the capillaries and the tissue spaces. While the figures are variable and depend somewhat upon other factors in general edema is likely to appear when the plasma proteins are below 5, grains per 100 cubic centimeters or the albumin is below 3 grains per 100 cubic centimeters.

The globuln factor aid in the resistance to infection Cannon Chase and Wissler (,) in 1943, demonstrated that the production of antibodies 1 only one fifth to one third as great in animals with protein deficits as it is when the proteins are normal Cannon and Wissler with Woolingle and Benditt (6) found that normal human serum contains about 2, milligrams per 100 cubic centimeters of globul in of this 8 milligrams or one third may be gamma globulin and it is in this one third that antibodies are found

Our study i based upon the use of protein digest (amigen) in 203 surgical patients from my private practice in the first o months of 1944. At two hosp tal amigen was gr en in travenously to mo to fite pat eats unt 1 they were able to take a soft det by mouth In another hospital I used no am gen but used

glucose and physiological saline instead as a control

The eating habits of normal man are well established. He eats three meals a day and does not wait until he feels exhausted before consuming, the next meal. It is no more loveal to go several days after operation without adequate nourishment. It is even more hazard ours since there is loss of blood and marked excessive breakdown of protein in the traums tized tissues. The postoperative fassitude and weakness have been attributed to the operation however may not the lack of nourish ment be an important factor?

In a series of 32 appendectomy patients without pentonitis we gave ami en once or twice on the day of operation. The next day they were placed on soft diets. An average of 1 328 cubic centimeter of amigen and 62 ca hic centimeters of other intravenous fluids were given each patient. Forty three liters of aminen were admini tered and 5 per cent of these caused reactions in 2 patients. One was a patient with acute appendicitis and severe nephrosis The preoperative pulse was 160 marked anasarca and plasma protein was only 2 50 grams per 100 cubic centimeters After the second infusion of ami en she was nauseated and vomited this may bave been due to the disease She died of nephrosis v hours after operation The other reaction was nausea without vomiting after the first infu sion There was no reaction after the second infusion Routinely these patients sit up in 3 days and are dismi sed in 5 days. They exhibit very fittle weakness

Twenty six hemiorrhaphy patients were given an axera of 038 cubic cent meters of amigen and of the 55 hiers infused there was a ditressing reaction in 2 per cent. One patient had nausea after the first of two infusions which was probably not due to the infusion as she was nauveated at different intervals during the same day.

An avera e of 36 5 cube c nt meters of one na and 376 cube centimeters of other of are coops fidled were given to 28 cholecy stee tomy pat ents. In a total of on liters of aim gen there was reaction to 4 per cent. One liter of aim en is given twice a day until nausea has creased at of the patient is a ready to take a soft

diet. These nationts are much stronger and are convalescing much more rapidly Most of them now sit up in c days and return home in 7 Of the 2 reactions there was a general malaise in a nervous patient in which the infu sion was given in 2 hours and 40 minutes Two had nausea In the first it was given too rapidly 2 hours and 20 minutes the other probably was not due to the amigen as she was developin symptoms of a bowel obstruction for which she was again subjected to operation

The pelvic operation group were treated the same as those with cholecystectomies and the results were similar. An average of 2 00, cubic centimeters of amigen 120 cubic centimeters of blood and plasma and 6, cubic centi meters of other intravenous fluid were given to each patient Of the 144 liters of amigen given there were distressing reactions in but a ner cent. There were a reactions of nausea and a of heariache and dizziness Four of the six reac tions were due to too rapid an administration of amigen 1 hour and 50 minutes to 2 hours and 20 minutes. These were all reactions to in fusions given in the early part of this study None had reactions with each infusion of amigen One had reactions with of the infu sions received and the others in only one

In a group of 17 thyroidectoms patients an avera e of 2 117 cubic centimeters of amigen and r 64 cubic centimeters of other intraven ous fluid were given. Of the 36 liters of amigen infused there were di tressing reactions to ra per cent Two patients reported nausea and one patient had emesis after two separate in fusions These patients were all rather thyreo

Fifteen mastectomy patients were given an average of 1 66 cubic centimeters of amugen and 66 cubic centimeters of other intravenous fluid Distressing reactions were reported after the use of 5 per cent of the 19 liters of amigen Dizziness was reported by a patient at was not given too rapidly and the patient was not otherwise distress d. These patients were placed on a soft diet within a short time after operation

In a group consisting of 3 exploratory celio tomies 2 liberations of adhesions 1 gastro enterostomy 2 leg amputations 1 Kondoleon

operation for elephantiasis an average of 22 cubic centimeters of amigen was given bre operatively to each patient Postoperatively they received an average of a see cubic centimeters of amigen 22 cubic centimeters of blood and 777 cubic centimeters of other in travenous fluid Of the exploratory celiotomies one was an inoperable carcinoma of the gall bladder another carcinoma of the rectorie more and the third carcinoma of the ovary with liver metastases There were 2 deaths in this group, the carcinoma of the gall bladder and r of the leg amputations. In spate of an average of a infusions per patient there were no reactions in this group

In the following four series the favorable results of protein digest intravenously were nuite marked because a lon er time elapsed before the nationts were able to resume eating They were given amigen I liter twice a day until it was safe to begin mouth feedings. Their maintenance of strength and well being was outstanding and they did not develop edema There was no need to give food by mouth until peritoritis had subsided and until bowel re sections had mute healed

In a group of 7 patients with peritonitis we gave an average of 6 326 cubic centimeters of amiren 228 cubic centimeters of blood 114 cubic centimeters of plasma and 1 250 cubic centimeters of other intravenous fluid Pro tem is especially indicated in peritonitis as there is considerable protein loss into the peri toneal exudate In spite of the everity of ill ness in these patients only two had reactions one was an 11 year old hov who suffered chills but no fever and the other a reaction follow ing the fifth of six infusions. This infusion was given too rapidly we later discovered 2 hours and so minutes to be too short a period for satisfactory infusion Of the 45 liters given there were distre sin, reactions to 4 per cent

In acute intestinal obstruction amigen is usually given preoperatively as well as after surgery Three patients with acute intestinal obstruction were given preoperatively an average of 2 333 cubic centimeters of amigen and 5 166 cubic centimeters of other intra venous fluid and postoperatively 8 666 cubic centimeters of amigen and 666 cubic centi meters of other intravenous fluid Thirty three liters were administered and there was distressing reaction in 3 per cent. One patient reported having a reaction of bad taste nau sea and emesis after an infusion. It is doubtful if it was due to the amugen as she was a very ill patient.

Ten patients upon whom gastric resections were done mainly for carcinomas and beingin ulcers were given in a verage of 3 300 cubic centimeters of amigen 50 cubic centimeters of amigen 50 cubic centimeters of other in travenous fluid preoperatively. Postopera tively they received 10 000 cubic centimeters of amigen 150 cubic centimeters of blood and 1 200 cubic centimeters of other intravenous fluid There were no reactions to any of the in fusions in this group. About one half of the patients with carcinomas are hypoproteinemic as judged by the reports of Karl Meyer. Memorial Hospital in New York (23) and the Brooklyn Cancer Institute ()

CANCER PATIENTS

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Therefore we correct anemia by blood trans fusion and protein deficiency by protein orally or intravenously before operation. This group progressed remarkably vell with scarcely any complaints of weakness.

The colostomy group of 8 patients were mainly for caronoma. It included obstructive resections of the sermoid. In these the clamp is left on for a or 5 days until the risk of severe infection of the would is reduced to a minimum. Preoperatively they were given an average of 6 cubic centimeters of blood and 50 cubic centimeter of other intravenous fluid postoperatively each received 10000 cubic centimeters of amigen 1105 cubic centimeters of blood and 111 cubic centimeters of amigen 1105 cubic centimeters of blood and 111 cubic centimet

meters of other intravenous fluid Eighty liters were administered with no distressin reaction. The patients strength remained good and with gastric suction there was practically no distention.

In giving 730 liters of aminen intravenously to 203 surgical patients there were no sever reactions. Most of the reactions reported were in the early part of this study, 6 per cent occurring, in the first 5 months when many of the infusions were even too rapidly. However there were reactions to only 5 per cent of the 730 infusions. If a 3 hour pend is allowed for an infusion of 1 rooo cubic centimeters of amigen we have little to fear from reactions.

A group of 50 patients were used as a control group durn the time that we were making an investi-ation of the use of protein digest intravenously. They received glucose and physiological saline instead of aim en. They seemed to be weaker and slower in convalescing than those given protein digest

It is realized that the conclusions drawn are based upon clinical impressions alone Plasma protein determinations have been of no avail since definite chan es do not occur within a span of a few days consequently they are of value only in chronic deficits. Unfortunately there is no method of measuring the ti sue protein and this is approximately thirty times as much as the plasma protein Except for re search purposes it is impractical to determine the total plasma volume rou hly it i about one twentieth of the body wer ht Therefore in an average 70 kilo ram man there is / o of 70 kilograms or 3 500 grams of plasma Plasma protein is normally 63 to 75 ams per 100 cubic centimeters Tak ng an avera e of 7 per cent the total serum plasma is o7 times 3 500 grams which equals 245 g ams. The total plas ma volume is variable. For example, t s greatly reduced in dehydration or shock and m such a state the total prote n determinat on per co cubic centimeters may be co siderably elevated but because of the decreased plasma volume the plasma protein in the total amount of blood may be decreased It is possible to get an estimate of plasma volume by determining the erythrocyte count hemoglobin and the specific gravity of the urine

For a serum drop of 1 gram per 100 cubic centimeters the total drop in the plasma is approximately 35 grams But as there is thirty times as much protein in the tissues we must assume that the protein loss from the body would be 30 times 35 grams or 1 150 grams This drop would require 2 or 3 weeks if no protein at all were given. It is evident wby it requires so much protein to return a patient with a chronic deficit to normal

## CONCLUSIONS

The use of protein digest intravenously has been proved by various investigators to be safe and efficacious in promoting general well being and strength and as an invaluable aid in tissue building wound healing combating infection maintaining fluid balance osmotic pressure and optimal gastric emptying

In our use of intravenous protein digest in 203 patients we found these results to be true we endorse its safety as a therapeutic measure We advocate the intravenous use of protein digest following major surgery as a routine measure until such time as patients are able to take adequate nourishment by mouth or until proper assimilation is assured

Our patients are clinically improved they are stronger display more pleasant cheerful attitudes and are able to be about sooner than those who are not given this treatment. They have a quicker return of appetite are more vigorous and ambitious in assuming accus tomed activity and show much less fatigue

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# DISARTICULATION OF THE INNOMINATE BONE FOR MALIGNANT TUMORS OF THE PELVIC PARIETES AND UPPER THIGH

EVERETT D SUGARBAKER MD FACS dLAUREN V ACKERMAN MD

THE operative removal of varying portions of the pelvis along with the subjacent lower extremity has now been occasionally practiced for ap proximately so years. Though a number of terms (interilioabdominal amputation inte rihoabdominal disarticulation interpelviab dominal amputation interpelviabdominal disarticulation interiliosacropubic disarticu lation hindquarter amputation hemipelvec tomy transiliac amoutation) have been an plied to operations of this general character we have chosen the simple descriptive above because it most closely fits the cases to be pre sented and constitutes what in our opinion is the ideal procedure in the majority of instances

The first attempt to accomply h such a removal is generally credited to Billroth who in 1891 undertook to treat a sarcoma of the pelvi by this means. His patient died several hours postoperatively Several other unsuc cessful tries by Jaboulay and by Cacciopoli then followed but in 1893 Girard resected a sarcoma of the upper femur carrying his line of division well up into the pelvis and was able to keep his nationt alive postoperatively A year earlier he had successfully removed a portion of the pelvis in another patient but this was done for a stump recurrence of a sarcoma of the upper femur fol wing an earlier hip joint disarticulation an increasin number of reports have been collected from time to time by various au thors (1 18) In the most recent of these Leighton collected 106 ca es The addition of 6 more inclusive of the authors cases brings the total to 13 Of this group 99 have been operated on for tumors of bone or soft parts in the region of the upper femur or pel as

and it is with these that the present writing is concerned

In evaluating any operative procedure for malignant neoplasms two primary factors must always be taken into consideration the primary operative mortality and the ablity of the operation to cure The factor of di ablity should also be considered in ary operation as mutilating as this one for there in o doubt that the di ablity is considerable. To date no satisfactory proathesis has been designed which will enable these patients to walk and ambulation must be accomplished with the help of crutches.

Of the oo cases listed d ath occurred in 38 at the time of operation a mortality rate of 28 per cent and although th cause of death has not always been tated it seem apparent that shock was responsible for the great majority since death u sally ensued either durin or within a few hours of operation With rever m thods of treating this surgical complication the mortality rate has dropped considerably Prior to 1935 death occurred in 6 per cert of the r corded cales in the postoperative period but in the past 10 years there have been only 6 postoperat ve deaths in the 4 patients operated upon a mo tality of 14 per cent The average a e of the group survivin operation was 35 years as compared to 40 years in the g oup which succumbed additional reflection of hock as the major compl cation

Attempt to evaluate the end results have been somewhat di coura-mg as the length of follow up in man), instances has been inade quate to draw any useful conclusions. Of 61 patients surviv no operation and followed up odded of desage in 1 year 2 up to 2 years a each up to 3 and 5 to 0 years. Nime were clinically well up to 1 year 6 up to 2 years

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2 up to 3 years and 4 from 5 to 9 years Six teen were not followed at all Unfortunately of the 21 patients who were reported clinically well we do not know how many later died of these though it is apparent that most of these patients died of disease within 1 year of operation and 22 of the patients had survived that period

A variety of tumors were found in the 45 patients who were followed. There were 39 with tumors of the bone , of the soft parts and t metastatic carcinoma (thyroid) who was alive t to s years later Of the tumors of bone there were 15 osteogenic sarromas 2 of the patients living 1 to 5 years 1 each of the osteoblastic and osteolytic types chondrosarcomas 3 living 1 to 5 years and 4 dead within the syear period 3 chondromas 1 a postoperative recurrence and all living 1 to 5 years 1 each of Dwing a sarcoma benign grant cell tumor and neuroblastoma each of the 2 latter living 1 to 3 years. Of the tumors of the soft parts 3 were of muscle origin and 2 of these were well 1 to 3 years 1 extraosseous osteogenic a unidentified. It is interesting to note that 2 of the 19 osteogenic sarcomas were living Undoubtedly the most favorable group consists of those in which the primary site of origin is in cartilage. It was difficult in some instances to determine accurately the existing pathology and the classification oc casionally had to be made on the basis of

#### ANATOMICAL STRUCTURES CONCERNED

inadequate data

In severing one side of the pelvis the following structures mut be divided skin muscles—(1) flat muscles of the anterior abdominal wall (2) retus abdominal (3) ischool cavermosis (4) quadrativ lumborum (5) illio psoas (6) gluteus maximus (sometimes saved) (7) pyritorium (8) levator an ligaments—(1) ilioliumbar (2) sacrospinous (3) sacro tuberous vessels—etternal iliac atters and vein deep epigastric gluteal (unless the gluteus maximus muscle is to be spared) pudendal nerves—branches of himbar plevus bone—symphysis pubis (or opposite pubic arch) sirrollac joint (or sacral ala)

Structures to be carefully guarded are (1) ureter ( ) bladder (3) rectum

#### PROCEDURF

Our experience has been confined to the use of continual spinal anesthesia (5) The needle is placed in the third lumbar interspace and is included with the lower portion of the novocain tubing in the operative held so that it may be more closely guarded or re placed if necess iry Anesthesia is maintained at the level of the umbilious Transfusion is carried out throughout the entire procedure into the opposite upper extremity and small doses of pentothal are periodically given as needed to maintain light sleep. The patient is placed in an oblique position on the table and bolstered with sand bags. This position permits sufficient mobility for easy exposure both anteriorly and posteriorly

An incision is made from the posterior superior thac spine to the symphysis ending just above the iliac crest and Poupart's ligament. This incision gives access to the entire linac fossa and vessels. The peritoneum is stripped away or the peritoneal cavity is entered if desired that it be left on the tumor or if for individual reasons it seems necessary to explore the peritoneal cavity at this point.

The external iliac vessels are next identified and the artery is securely ligated about 1 5 centimeters below the internal iliac The leg is then elevated for several minutes in order to recover some of the blood contained in it following which the vein is ligated. The deep epigastric vessels are ligated and the pubic attachment of the rectus abdom nis muscle is divided. The bladder is stripped away from the pubis the penis is retracted toward the opposite side and the symphysis is divided either with a knife or by passing a Gigli saw behind it and cutting from within outward The pubic attachment of the ischiocavernosus muscle is divided close to the bone. Severe bleeding from the periprostatic and peri urethral venous plexus may be encountered at this point Exposure is usually inadequate at this point and the bleeding is best con trolled by sponge packing until the specimen has been removed

The skin incision is then continued from the posterior superior iliac spine in a downward lateral direction. The flap will be adequate if

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The lesson was clas ified as an osteo en sarcoma rather than a chondrosarcoma be cause neoplastic osteoid tissue and bore were evolving directly from sarcomatou stroma However because of the large amount of cartila e and its relatively well differentiated character as a whole this tumor has a better promosis than the osteogenic sarcoma v hich is extremely cellular and vascular Grossly and micro copically the excision was adequate At the end of year the patient was without evidence of local recurrence or distant metas tase A postatectomy was necessary on December 6 94 The promosi should be good in new of the time that has elapsed since operation (F1 6)

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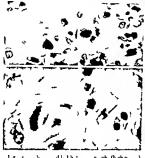
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It ha been postulated by Leriche and Policard that in the formation of heterotopic bone two things mu t be tresent embryonic fibroblast and an exces of calcium Butler reported a case in which a metasta izin, osteo genic sarcoma le eloped from a l ilky cal cifying hematoma However VI ry (2) pointed out through a series of x ray films in 2 cases that the active phase of metaplasia may occur before the deposition of significant quantities of calcium \ rav examination of our patient showed no evidence of calcification and multiple sections showed a tead tissue but no bone Virchow Mallory (1) and Leriche and Polica d beli e that meta plasia of connective tis ue can form ca tila e



Fg 6 P tpe ti ph tg ph fp t t C se

and bone and experimental studie by Asami confirm the observation. The was evidently the mechanism in our case.

The e tumor are e tremely rate and most cases reported in the literature have insufficient histolo ic study and follow up to be of value (3 8 14 3 32). Meticulous disection of the surgical specimen is most important in determining, the exact site of or in There is a question wit their trauma in the have influenced the genesis of this growth. The promo is was poor in spite of the technical success of the operatire procedure.

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The differential diagnosis between a lipo sartoma and a metastatic adenocarcinoma of bone originating in the kidney is at time difficut although liposarcomas rarely metasta



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size to the regional lymph nodes. Micro scopically they both may reveal lar e amounts of sudanophilic fat and gly cogen If multiple sections of the metastatic focus are taken and there are no papillary or glandular structures as in our case the dia nosis i ob cure. The primary kidney tumor may be so small as in this instance that pyelograms cannot deter mine the diagno is The most important and ing in the micro copic appearance is the character of the individual cell In the renal cell carcinoma the nuclei are centrally located with well defined outlines and rather foamy vacuolated cytoplasm (Fi 11a) Liposar comas on the other hand invariably have some cell with eccentric nuclei which are ompres ed to a crescentic shape by the fat filled cytopla m (Fig 11b) The ab ence of the e cell in the case plu the involved in uinal lymph nodes should have determined the biopsy dia nosi

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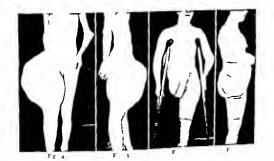
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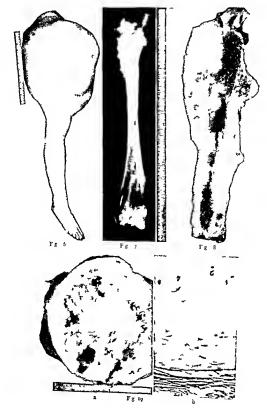
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In 28 cases of multiple exosto es reported by Lichtenstein a developed malignant change He feels that probably the number of cases would have been higher if more time had been allowed to elapse According to Lichtenstein a histologic criteria, our case should be classified as questionably malignant. However if one takes into consideration the gross appearance the chinical course and the fact that other cases have been known to develop distant metastases then a diagnosis of chondrosar coma is justified The peripheral chondro sarcoma has a much better proposis than the one arising centrally It tends to grow slowly remain localized for a long period of time recur if inadequately removed and finally to metasta ize through the blood stream (23) The metastases are often only extension of the tumor into the large veins and have been known to pread all the way from the femoral vein to the pulmonary artery (17 30)

The di case has been classified by some as multiple cartilagenous exostoses but is probably best de ignated as chondrody splasia. The fundamental cause lies in the proliferation









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and os iteration of hone forming cartilage. It is hereditary in nature the prohiferation and ossification of intermediate cartilage occurring during the period of skeletal growth (6-7-16).

This pati nt has gained so pound since or action is in excllent general health and is thic to u e her crutches very well fires o at) A prosthe c may be made. In view of the pathology and wide even on the pro nos uppears excellent afthou h it i possible that

malignant chan es may develop in one of the other lesions

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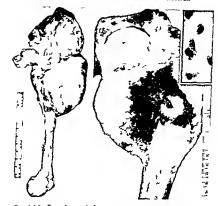
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The location of this tumor the gross ap pearance apparent origin from muscle and the microscopic findings all substantiated the diagnosis of rhabdomyo arcoma. If the pattent had recovered from the operation pull monary metastases or local recurrences would probably have developed within a year.

CASE 6 J G EFSCII No 7018 A 55 year ld m I va admitted the hop tal in De embe out Fou ye is before the pte tsuff J seve et a ma at the fit thigh. The st of injuty va pain I seve all 1 we but there we no further symptom that it is the there we no further symptom that pter the pter to the pter state of the pter state o

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This tumor gree slowly for at least yea and examination showed api a ent complete remo al B caue it is as a hont oss coma probably arising centrally, thee h uld be a good 1 rorin i although not i un't histologically) al vars possible. This again shows the importance of the pathological pattern in determining the ultimate prognosis

#### RECAPITULATION

As a life saving measure transection through or above the innominate bone appears to be a very effective procedure in handling sarcomas of the pelvic parietes and upper thigh. The mortality rate of 14 per cent for the past 10 years as compared with 50 per cent for the preceding 40 year is very en couraging. That only 90 operations of this sort have been reported during a 50 year period is clear indication however that only a very few of these case are being given the benefit of radical surgical removal. A glance at the tables in the book by Geschickter and Copyland confirms this since none of their matients was treated in this manner.

A comparison of our own experience with that of others would indicate that a dispro portionately large number of younger patients have been selected for operation. Of the og cases reported exclusive of our own only 11 were over the age of 50 and only 2 were over 60 Since Fitzwilliams ca e repre ents the only one (besides the authors ) over 60 years surviving operation there might have been some justification for such selection in the past It should be recalled however that a high percentage of osteolytic sarcomas of bone in which the prognosis is extremely poor will be found among the vounger group With the decrease in operative mortality it would seem reasonable to elect patients in the future less on the basis of age and more on the basis of the patholo y of the tumor

It is apparent that the benign tumors such as the neurofibromas benign giant cell tu mors giant osteochondromas and chondro mas may be expected to present the best prognosis The next most favorable group will be the chondrosarcomas arising either peripherally or centrally The peripheral group arising usually from cartilaginous exos toses will offer the better outlook. Well dif ferentiated soft tissue sarcomas of long dura tion should be operated upon although the prognosis will be less favorable Osteogenic sarcomas forming large amount of adult car tilage (Case 1) should certainly have the bene fit of operation This is also true of o teolytic o teogenic sarcomas and very undifferentiated soft tissue sarcomas although among these

the salvage will be very low. Ewing 5 sar comas plasma cell myelomas and metastatic tumors if recognized as such should probably not be subjected to such an operation except under unusual circumstances

Examination of the surviving patients re reals that in certain instances even more radical treatment is necessary if the results are to be improved. There is no known sur gical means of coping with subclinical metas tases and many patients presenting these tumors will undoubtedly die of distant spread sub equent to re ection as is already known to be true of histologically similar tumors situated peripherally in sites amenable to the commoner types of amputation On the other hand it is frequently within the surgeon's means to prevent local recurrence as it is a well known tendency for many of these sar comas unless widely removed to recur stub bornly Obviously one of the distinct advan tages of operations of this sort for tumors in the upper thigh and lower pelvis is the wide removal permitted \ let of 45 patients fol lowed 8 developed stump recurrences The first case a chondrosarcoma of the lower in nominate bone with incomplete section above had a recurrence 17 months after operation The second case had a chondrosarcoma of the ileum with section through the notch and there was a recurrence in 5/2 years In the third case a chondrosarcoma of the ileum the gluteus maximus was preserved recurrence r month later In the fourth case a chondro sarcoma of the ileum there was a recurrence in 2 years In the fifth case an osteochon drosarcoma of the acetabular region section was through the notch recurrence 12 months later In the sixth case a my vochondrosar coma of the upper femur an effort was made to save the adductor muscles recurrence 6 months later In the seventh case a benign recurrent chondroma of the ileum there was recurrence 4 years after operation eighth ca e a spindle cell sarcoma of the upper thigh section was through the sciatic notch recurrence 5 months later Probably not all of these were avoidable but it is significant that in 4 of these the innominate bone was incom pletely removed although it represented the site of involvement in 3 In 1 instance the

gluteus maximus muscle was pre erved when the tumor was situated in the adjacent and at tached thum. In still another ca e with tumpr in the upper femile attention was focused on the preservation of a long medial skin flap with the underlying addictor thish muck, and the obturator artery Six of the e 8 recurring ca es were chondre matous tumors of lene and 2 were soft part spindle cell tumors. In nur first case in recognition of the tendency which bone sarconias have f r crossing 1 into the entire innominate bene wa remove I together with a generous egment of the eppo ite put is as well as the ala of the sacrum In Ca e 4 the gluteus maximus mu cle was removed in crder to maintain an additional zone of afety be tween the disca c and the line of cetion. Both of these patients remain well. Experience to date therefore indicates that fuller advantage of the procedure should be taken in makin it as radical as the tumor demand and the anatomy permits. It is firmly believed that when this is done the end re ults will be con siderably unproved

#### SUMMARY

1 Fifty years have clapsed since Guard first successfully resected a portion of the pelvis along with the lower extremity for a sarcoma of the upper fumur which would not lend itself to disarticulation at the hip joint

2 Similar procedures have now been re ported for malignant tumors of the upper femur innominate bone and adjacent oft

parts in 90 patient

- 3 Although an overall mortable of 3 per cent evt is that of the first 4.0 sear period was 50 per cent but during the past 0 years it has dropped to 4 per cent. This drop has been largely due to development in the treatment of shock which has been the primary complication of this operation.
- 4 Follow up data although woefully in adequate indicates that of 4.5 pa ients surviving operation and followed for om 1 to or more years remained clinically well and 4 died of the r disease
- 5 The deformity although considerable is borne gratefully by these patients who have usually become convinced that the e emains no hope of cure

6 The anatomy operative procedure and variations in technique are di cus ed

7 Six unselected cases are given all with at least a removal of entire innominate bone

8 In criticism of the past treatment it makes and that far too few patients have recrived the benefit of radical operation that the advantaces of wide received have not been sufficiently exploited particularly as reard partial or incomplete removal of the innomiate I can when that I one it elf-represent the sits of the tumor that with m readequate contrib (if the mortality patients be selected to see in the basis of a and more on the bail of the patholo vo fine tumor. It is behaved that consideration of the e-factors in the future will favorably influence the prorous is in sarcomas of the upper this hand pelvic parieties.

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#### PARACHULE FRACTURES

#### PAUL A KNEIPER t ACS May MC St J ph M ssour

SURVEY of fractures which occurred in a regiment of paratroop infantly during a 6 month period of intensive training is presented. The injuries sustained in jump training at Fort Benning have been covered by Tobin (2) Lord (1) and Tobin (3). The altitude of the area over which jumps reported in the present study were made is approximately 4 000 feet. In marked contrast to the training area at Fort Benning Georgia too feet above sea level.

The over all nodence of casualties was as a high as roper cent in some of the jumps at the beginning of training. A casualty was defined as absence of soldier from duty for 24 hours or longer. The number of accidents was rapidly reduced until at the end of the period of train ing the casualty rate was less than 1 per cent

The optimum peed of the airplane during release of parachut its is about 100 miles per hour for a static line jump. The pilots had difficulty slowing to that speed in the 4 7 Tran port at the beginning, of training owing to the relatively low density of the atmospher, over the training area (Mean barometric pressure about 6 o millimeters of mercury against 760 millimeters at sea level). The jumps were made at 800 feet above ground level in the beginning of training gradually dropping to 600 feet as the pro\_ram went on

The impact at which the parachutist hits the ground is equal to that ol a fall from a height of 10 to 15 feet. If the ground is at an altitude of 4 000 feet, the impact is equal to that of a fall from 1,5 to 20 feet.

A wind of over 12 to 15 miles per hour greatly increases the number of casualities. In the area where these jumps are mide the standard saying is. If you do not like the wind or weather wait to minute and it will change. Consequently jumps were occasion ally made, in wind vel cities a high as 35 to 45 miles per hour. In practice maneuvers with other authorite troop the jump had to be made as scheduled thus causing some jumps to be made during inclement weather.

Isychoneuroses including hysterical states and malingering were very uncommon in paratroopers. Fractically no cases were seen in officers. A few occurred in enlisted men toward the end of training when the outfit was very hot. Most of these were trainmatin neuroses in volving back pain following a jump and were completely refractory to treatment of any kind physical or psychiatric.

Back injuries were not common. There were 7 cases of compression fractures of the vertebrac. None was complicated by paral ysis. There was not a single case of protruded intervertebral disc found during this period of training. Back sprains of any severity were uncommon as the men were taught to land on their feet and roll forward. The 7 cases of compression fracture were all associated with one of two complications the primary chute did not open and the secondary chute was used or another parachutist accidently emptited part of the air from the chute. Which carried the man who was injuried. There were no compound fractures and no fatal accidents.

The head injuries included two (a) linear fractures and four (4) of the basilar type. The e injuries all happened in a high wind which caused the parachutist to land side ways striking the head in some manner. All recovered but 2 of them were permanently removed from jump status because of post traumatic symptoms. Encephalograms revealed no evidence of gross damage to the brain. I am unable to state if they were in stances of traumatic neurosis or permanent cerebral damage. None of the patients was subjected to surgery.

Acromodavicular separations were not common Injuries to the acromicolavicular joint were treated by depression of the clavide and immobilization. Separation of the conoid and trapezoid ligaments was repaired by open operation. The technique of Bunnell using fascia lata was employed. There were 4 of these cases. Satisfactory result was obtained and all returned to jumpine after 4 months.



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I ollowing is a list of the types and numbers of fractures skull 6 nose 4 mavilla; humerus 3 radius 4 navicular (carpal) 3 metacarpals 6 phalanv 7 rib 4 comprission of vertebrae 7 sacrum 1 coccy v 1 fumur 1 patella 2 tibia 22 trimuleolar 6 fibula distal portion 29 astragalus 1 os calei 3 cuboid 2 tarsal 2 metatarsal 7 toes 4 a total of lower extremities of 79 and a grand total of 120

Fracture of the posterior hip of the tibia is o typical a parachute injury that it has been named paratrooper fracture by Tobin (3) This fracture is uncommon other than in para clute injuries and for that reason has received a small amount of attention in the literature of traumatic surgery.

Parachutt ts are taught to land on the ball of the foot. The is possible if there is no wind



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and the terrain t even but too often the interest occur when the west ht of the body is tran mitted throuth one foot instead of being divided the extellent type of boot worn by the parachutist prevents the fracture from being more frequent, because it distribute the transmitted

force throu h the lower leg
The anatomy of the ankle joint further ev
plain the fracture. The po terior lip of the
tibin 1 lower than the anterior so that the
joint morth e 1 wider anteriorly than po
teriorly. The external and internal malleol
keep the astragalism in hie and a transmitted
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surface is most commonly involved. Separation of fragments is rare. Open operation has never been necessary in my experience in fracture of posterior lip from parachute injury.

This history is typical the parachutist lands on one foot in uneven terrain or due to socillations from a high wind with immediate pain in the ankle joint and great difficulty in walking In all such fractures which occurred at this Station not one was missed in the field. By this I mean they were sent into the hospital immediately, and demonstrated by lateral x ray films. This justifies the term paratrooper fracture because it is so often diagnosed accurately by field medical units.

A method of treatment was established which I would like to describe in detail (1) A padded plaster cast is applied from the base of the toes to the tibial tuberosity (2) The foot is placed in the neutral position inversion or eversion ie a line through patella would go between great toe and second toe) (3) The ankle is placed in exactly 90 degrees dorsiflexion (4) An anesthetic may be necessary to get the ankle in proper posi tion (5) The patient is kept on absolute bed rest for 1 week with elevation of the extrem its on two pillows (6) After a week the cast is removed and replaced by another cast with a very small amount of padding. A section of wool felt 2 by 2 inches is placed dorsally over the tarsal bones (7) After 48 hours the patient is allowed to walk on the leg. No crutches or walking calipers are employed The cast will frequently break on the bottom but good support is given to the ankle never theless (8) The cast is removed after 2 weeks and daily whirlpool baths of 30 minutes in the morning and infra red treatment for 1 hour in the afternoon are given. One week of this treatment will suffice ordinarily and the para chutist is ready for full duty including marches There will be no circulators changes

Case Ptntwa ) d pracht jump hen he la dd hhs te ght h ght leot Th w mm datep elling d hs bitv ith rght nki Phy cal am aton b ed am keds ll g fth a ki (Fgs 1) A c ulr pl ste c t a appl d v th foot i

in soft tissue or bone no swelling of the ankle

at night and no re triction of motion

ne tral po t on and ankle at 90 The foot was kept
30 days 1 ca t and patient v as 37 days in ho pital

Case 2 Patent singured in a pa achute jump hen his right a ld got ca ght in the spenial naladings that he do tast isted this ankler man ng statio any There as immediate pains eld gend a abity to all not the ght foot Physical am nation showed res the grid that a alk ng tro (Fg 3.4) Lg in cast 30 day patte t in hop pital pd d vs

Case 3 Patent singur d month befor ead mass eleshere hen he bet me in ingle! inthamoth r chute n land ga d jured h left and! He a tre ted as an out pat in but handle r minds ill n and p inful (Fig. 5). A plaster cast w sappl d for 30 days. T tal time the bo patal wa. 4 days p result

Case 4 Pate t sinjured in a parachute jump i a high ind he h landed nitely on his lift foot and t ist d in fall g. There is immediate pas as ill g and i high; t lion in heltankle. Ihis levam toos is edmarked in ling of the lift in lift [58 6 7]. Op noperat that ere in it nal mall olus through the biblio his lift in lift [58 6 7]. Op noperat is the cre in it nal mall olus through the lift in lift is a lift in li

Case I shows the ideal result when the aforementioned routine is carried out

Case 2 demonstrates an increased length of time when the ankle is not immobilized at exactly on degrees

Case 3 shows the permanent disability that may occur in an ankle if the fracture is not recognized primarily and properly treated

Case 4 shows a severe type of fracture and the good result obtained from open operation

#### CONCLUSION

1 A review of the number and type of fractures encountered in parachute training of a regiment at a relatively high altitude is presented with a brief discussion of the cause of such injuries

2 Typical case histories of paratrooper fracture are outlined

3 A detailed method of treatment of paratrooper fracture 15 given

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opening up of the perirectal space by finger th section the best possible drainage is ac quired To avoid turning the patient the lithotomy position with a sandbag under the sacrum should be used for excision of the coccyv 1 wound near the lateral border of the sacrum may be extended vertically along the side of the coccyx and sacrum good acce to the p rirectal connective ti sue plane is thu obtained

There is never need to destroy the sphincter mechanism by division of the anorectal mus culature but dilatation of the anus and the insertion of a large tube at the end of the oper ation will aid drainage

During convalescence if the perirectal space has not been drained and there are signs of spread of infection no time should be lost in

opening up this area

With bursting or explosive injuries be cause of the time lag extensive soiling etc. it 1 u ually unwi e to attempt reposition of the retracted bowel. When this has been done sutures have usually cut out and what is more serious drainage has been inadequate sepsis is kept up by pocketing under skin flaps etc. In one such case, the patient improved only after pocketing under bridges of skin and extension of sepsis into the buttocks were treated by laying open widely the whole area The speed with which the perianal wound heal d and the patient improved was a tonish The anal canal will function normally whatever its position if its nerve and muscle control has been pre erved. Wide excision of he perianal musculature is usually unneces sary and should be avoided

Foreign bodies encroaching on the sacral canal should be treated with con er ati m and caution since there is a definite isk of men ing t One such patient arrived at the Base with established meningitis high responded to sulfapyridine the metallic foreign body was removed 4 weeks later the patient havin sulfapyridine before and after operation. In the series removal of a foreign body on the 8th day was followed 10 days later by death from menin\_iti

Int ape toneal non ds When an abdom inal lesion has been diagnosed explorat on of the entry or exit wound should be defer ed

until the abdomen has been opened and the pelvis examined It may be possible to suture an intraperatoneal tear or if the cannot be done the dama ed area may be shut off from the general peritoneal cavity by means of the omentum or a Coffey drain 1 catheter i placed down to the site of injury a colostomy establi hed and the abdomen closed A sus pension of 10 grams of sulfadia ine in 50 cubic centimeters of a solution of gelatine and saline (1% gelatine in normal saline) is in sected down the catheter. The wound of entry exit or both are then trimmed and en larged for drainage turnin, the patient hould be avoided if possible The wicks of the Coffey drain are removed piecemeal after the .d day

Colostomy The most desirable ite for a colostomy is as near the rectal le ion as possi ble ie a sigmoid colostomy with a god spur If a plastic repair operation 1 considered likely in the future it is best to leave a good loop of colon below the temporary colostomy In cases of urgency the colostom, may be performed throu h the exploratory inci ion For an exten we wound of the pelvirectal reg on with a short sigmoid loop a transverse colostomy will make future operation on this portion of the out easier. It mu t always be remembered however that the prime object of the operation is to save life

Repair of rectal pe forations This problem will not be faced as a rule for se eral months after wounding Continued infection espe cially from osteomyelitis will prevent plastic operation but it is important during this waitin period always to assure free drainage and complete exclusion of the rectum by means of a satisfactory colostomy

Unle s there has been extensive tea ing of the gut intraperitoneal wounds will probably finally close themsel es the difficult cases are those extrapentoneal wounds h h in the rec tum under cover of the sacrum especially with a fistula passin throu h the b ne The internal openin of these fistulas is usually ob cured by a shelf of muco a and the rectal wall is firmly adherent to the sacrum

Daily injection into the d stal loop of the colostomy of a freshly made 20 per cent sus pension of sulfasuxidine in water (pH 7) is use

ful in controll ng infection

Pencillin will undoubtedly help in the clo sure of these fistulas. In the case of one pa tent with a large tear in the posterior wall of the lower third of the rectum early repair was attempted followed by the use of pencillin locally.

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#### ANALYSIS OF CASES

In a senes of 32 penetrating wounds of the rectum there were 26 extrapentoneal lesons and 6 intrapentoneal or combined Since most of these patients were seen at the Base it seems that either intrapentoneal injury less common or more likely extrapentoneal damage to the rectum is less dangerous. Rapidly fatal acute infection occurred in both types of wound

#### Extraperitoneal II ounds

Of the group of 26 extraperitoneal wounds there were 5 of the anorectal region complicat ing wounds of the buttock or perineum. In a the aporectal area was torn while in injury was mainly of the bursting type of in jury of the perineum with retraction of the anal canal The 3 patients with avulsion of the anorectal region were treated by colos tom; and drainage. In 2 the colostomy had been postponed for 3 days r of these died of gross infection of the wound The 2 bursting injuries were also treated by colostomy and by reposition and suture of the retracted anus In both cases the sutures gave way though in I case the right side of the anus remained in position During convalescence the provision of free drainage necessitated wide division of the skin and the laying open of all subsidiary pockets in r case In 3 of the 5 cases fracture of the bony pelvis (ischium pubis and coccyy) complicated the anorectal wounds and in r case the extrapelvic urethra was injured

There were 21 wounds of the rectum and the sate of entry was as follows buttock. IT sacrum 7 groun 1 hips 1 buttock and groun 1 The diagnosis of injury of the rectum was not made in 7 cases (one third) until feces or flatus were passed through the entry wound 4 to 6 days after the wounds were received In 1 case with associated bladder injury the poor condition of the patient suggested injury to the rectum on the sectond day. The of the 7 undiagnosed cases were treated by late colostomy. Two died 1 with associated bladder injury the other from memingitis following removal of a forein body from the sacral canal on the 8th day.

Injury to the rectum was diagnosed in the remaining 14 cases (two thirds) as follows

blood per rectum on examining finger 2 extensive sacral wounds with fractum. 2 feers in the entry wound 2 tear palpable 2 blood per rectum and palpable tear 1 tear visible i exploratory laparotomy—marked extra peritoni

The time lag in the cases of wounds of the rectum was recorded in only 11 of the diag nosed cases within 12 hours there were 5 cases and of these r died of hemorrhage and shock and 3 of fulminating infection within 12 to 24 hours there were 5 cases and all re covered but I was traced for only 7 days and 1 other died from infection 7 weeks later within 20 hours there was I case and he recovered Two of the 5 cases in which opera tion was done within 12 hours had severe in juries and were not expected to recover. The number of ca es (including the undia nosed) that recovered in spite of a long time lag is urprising Even though these injuries may kill quickly from fulminating infection a num ber of patients recovered even without early colostomy

Of these I cases with wounds of the rectum 14 were associated with fractures (two third) as follows fracture of the sacrum 6 fracture of the ischium 4 fracture of the pubsic 2 fracture of the coccyx 1 fracture of the hum 1 In 2 of these cases the femur was fractured in addition and in 1 the fracture extended into the hip joint

Other organs were affected as follows bladder 2 of which i died urethra i who died cauda equina i who recovered

In the cases which were chagnosed treat ment consisted of colostomy with or without abdominal exploration the wounds were trimmed and enlarged for drainage. Though in these cases there 1 no definite information available of the u e of local or general chemo therapy its use was routine. Anti,as gan gene serum was also used in a few cases

## Intraperatoneal and Combined Wounds

Ther were 6 cases in this group. The site of ent y wound was as follows buttock. 3 sacrum 2 perineum. As to diamost all had soms of intra abdominal injury but in 2 cases only was there any indication of a

rectal lesion before laparotomy -1 with blood on the examining finger and the other had a large sacral wound

The time lag was 8 to 16 hours except in 1 case in which the lag was 24 hours and in an other 36 hours. One patient with a time la of 8 hours and an an another of 5,0 hours dued of acute infection. The 16 hour case in which patient recovered passed a lar e Ascans lumbricoides on the r6th day. In the 24 hour case patient had an extraperitoneal lesson of the rectum and though the rectorescal pouch was full of blood no intraperitoneal lesson was found. The patient had several secondary hemorrhages from the wound rectum and colostomy requiring li attie of the superior gluteal and finally the internal ilias artery.

Other injuries found in this group were fracture of the sacrum in 2 cases and injury of the small gut in 4 cases

All patients in this group were treated by exploratory laparotomy colostomy and drain age. In 3 cases the intrapertioneal rectal tear was sutured and all recovered in 2 cases in utra-pertioneal lear was impossible and both died in case the rectal lesion was extrapertioneal and patient recovered. Local sulfa dru were used except in the 36 hour case with eneral peritonial and for the extra peritogeal injury of the rectum

#### Vanpenetrating II o nds of the Rectum

There were 6 case in thi group In 3 cases abdominal tenderness and rigidity suggested intraperitoneal damage and exploratory lapa rotomy was performed. In all the e cases there was extensive retroper toneal hemor rha e in the pelvis with peritonitis though in 2 there was no evidence of penetration of the peritoneal cavity the small gut was injured in the third case The time lag in the case ex hib ting abdominal signs without penetration of the pelvic cavity as r and 6 days Colos tomy was established in all cases. In the fourth case exploratory laparotomy was per formed because an extensi e sacral fracture and cated an injury to the rectum a colostomy was made as there was p esent a lar e retro peritoneal hematoma. In the remaining 2 case colo tomy was not performed The

foreign body was removed from the pararectal tissues in 1 in the other a small foreign body could be felt through the rectal wall This patient complained of pain in the perineum especially on defecation pressure on the for eign body produced pain in the distribution of the 3d 4th and 5th left sacral nerves small granulomatous nodule in the region of the foreign body was visible on sigmoido conv

#### Complications

During convalescence it is important to maintain adequate drainage constantly Osteo myelitis not infrequently follows injury to the bony pelvis and pocketing and tracking of pus occur Large wounds of the sacrum are difficult to nurse and are subject to prolonged nfection with its concomitant risks. Men ingitis following lod ement of foreign bodies in sacral canal has already been mentioned after considerable time preliminary sulfona mide therapy and gentleness in removing such foreign bodies are essential. Only when a for eign body here requires removal should it be operated upon Diphtheritic infection of the sacral wound was seen in I case Secondary hemorrhage complicated 3 cases-rather a higher incidence than with wounds of the extremities

#### Deaths

In the extraperitoneal rectal wounds there were 8 deaths Two occurred within 4 hours I from a fulminating infection and I from hemorrhage and shock The death from ful minating infection (color septicemia) occurred in a soldier who was operated upon 12 bours after wounding. His wounds were severe in cluding a fractured femur and a torn urethra and injury to the small gut in the rectovesical pouch He died of profound toxemia with a terminal temperature of 108 d grees ded within 48 hours from a fulminating in fection (colon septicemia) He was operated upon 1 hours after wounding The abdomen was distended but there was no peritoritis One died within 5 days Operation was per formed 8 hour after wounding There was extensi e retroperitoneal bruising. He became jaundiced after blood transfusion but death was most likely due to severe infection Two died within 14 to 21 days 1 on the 16th day

from gas infection of the abdominal wall and thighs and secondary hemorrhage one on the 18th day from meningitis following the re moval of a foreign body (time lag 8 days) Two died after a month in a death occurred in 48 days from infection following injury to both bladder and rectum with a rectovesical fistula The rectal injury was not diagnosed and colostomy was performed late. In the other case death occurred in 49 days from an anaerobic streptococcal infection associated with fracture of the sacrum and neck of the femur chemotherapy and repeated blood transfusion were of no avail

There was I death in the anorectal wound group Death occurred in 10 days from ex tensive infection of the perineum and buttocks together with bronchopneumonia Colostomy had not been performed until the 3d day

There were 2 deaths among the intraperi toneal wounds Both occurred within 6 days In 1 from an unsutured tear of the rectum treated after a 36 hour time lag by drainage and colostomy Patient was jaundiced before death and had peritonitis and toxemia the other from an unsutured tear of the rec tum treated after an 8 hour time lag by drain age and colostomy Patient had acute tox emia but no evidence of peritonitis

In the nonpenetrating wounds r patient died from a wound which involved the thigh and the pelvis was fractured anaerobic streptococcal infection and osteomyelitis de veloped and death followed in 1/2 months

In the last world war a small series of younds of the rectum complicated by wounds of the small intestine showed a mortality rate of 100 per cent while in the Middle East in this war a small series of similar wounds showed a mor tality of 71 4 per cent (Ogilvie) In this paper since there is no information available of all the deaths from wounds of the rectum in the Forward Units a mortality figure cannot be given However compared with the last war the number of survivors suggests an improve ment in results SUMMARY

- The classification and diagnosis of wounds of the rectum are discussed
- 2 Operative treatment of extraperitoneal intraperitoneal and combined wound is de

scribed The indications for drainage of the pelvic cellular tissues are given

- 3 The risk of spread of infection within the pelvi with nonpenetrating wounds is men tioned
- 4 Thirty two penetrating and 6 nonpene trating wounds of the rectum are analyzed
- a Among the penetrating injuries there were 26 extraperitoneal and 6 intraperitoneal or combined wounds
- b Early diagnosi was made in only two thirds of the extraperitoneal wounds the methods of dia nosis are shown. St as of

intra abdominal injury were present in all cases of intraperitoneal or combined wound c The incidence of various sites of entry

- wounds of fractures of the pelvis and of other injuries is given
- d The time lag complications and deaths are considered

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F AS SIE JOBN Brit M J 9 7 3 Go Do W 1500 SIE CHARLE Surg ry f Mod m W rf e 3d d S t xvu Cb p bxvu Edited by Hamilt B il y B lum Th Willim d

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#### CONCUSSION OF THE SPINAL CORD

#### An Experimental Study and a Critique of the Use of the Term

R A GROAT Ph D W A RAMBACH I B S and W F WINDLE Ph D Cheag Illin s

THE meaning of the term concussion of the spinal cord is sufficiently value to be a source of irritation to those tho wish to use it. The p esent investigation was undertaken because it was felt that ex perimental clarification of functional and morpholog cal aspects of an uncomplicated injury to the spinal co I the type v hicl rightfilly deserves to be calle | concussio | v as needed to aid | restrict in the phere of appl cats of the term Studie in br in concussion (13 14 4 ) provide la lack

grou d fo tle present exp riments

As a li be les r bed in the prese t report un compleated co cuss on of the pinal oid in the cat is a complete function lillo k of the pinal co d at the level of application of an adequate force to the nervous pa enchyma. Ner e cells es pecially of interneurons and long ascending and descending fiber tracts are invol ed. The pe iod of concussion a brief passi g into the pe od ol po teoneuss on when the paralys s cease but histolog cally demonstrable cell alterations or cur in concussion and frank chromatolysis s e i dent in postconcussion as a direct result of the injury sustained. In any speces if some other morph log cal change is present e.g. compression fracture self reducing fracture dislocation se ere epidural or subdural bleed ng c ntusio or lacera

functional alterations upon those of concuss on the injury is not concussion but concussion plus MATERIAL AND METHODS

the compli ating injury

tion of the spinal cord or spinal nerve cots or in

tramedullary hemorrhage v hich super mposes

Concussion vas produced v cats by st king a s ngle blow against the back of a freel suspended an mal ith a blunt wood instrument s ung in a horizontal plane Chalk appl ed to the strument enabled accurate determination of the site of the blow Most of the animals were lightly a

F m th 1 tt f N ol gy N h es Med cal School Th k desc bed this pape was d d commended by h C mm Med al Resc th Off. [S this Resear h and D lopm west m Uni ersity h bet een d \ th

tized with chloralosane Others were struck after the somal cord had been transected at the mid thoracic level under ether and the region of the operation anesthetized with procaine. The blox was strong enough to produce a brief paraplegia when applied over the lumbar enlargement in in tact unanesthetized cats

In all animal the saphenous branch of the fem oral nerve was expo ed on the thigh and a uni polar or a bipolar stimulating electrode was at tached to it In 3 cats a fine bipolar stimulating ele trode i as placed in one pyramidal tract in the po s with the Horsley Clarke instrument. The st mulator employed was one which gave a re versel saw tooth wave and the voltage fre quency and the falling phase of the stimulus were controlable Output dial were calibrated to show

peak voltage

The threshold voltages for elicitation of the appropriate responses were recorded over a 10 min ute period immediately preceding a blow. Uncomplicated concussion was deemed to have occurred when the threshold rose instantaneously following a blow and then returned uneventfully to the con trol level Blows were applied over various regions of the spinal cord In two of the cats receiv ing midthoracic blows the vagus nerves were cut at the start of the experiment. Observations of functional alterations were made in 27 cats Seven were allowed to live for 6 days 3 for 14 days and mdefinitely after the concussion the rest were killed at the end of the threshold testing period All except the 14 day animals which were used for Marchi degeneration studies were perfused with 10 per cent formalin2 (following initial vashing out of blood with o o per cent NaCl) while under nembutal anesthesia and were then autopsied

Ten of the formalin perfused animals fur ushed histolog cal material For additional histo ogical material 3 cats were arranged for perfusion befo e being struck. The start of flow of formal n as timed so that fixing flu d entered the animal s body approximately 5 seconds after the blo v was Des gned b D Crag Goodw d mI t that desc bed by D sed B re ( 1 and M Culloch (9) sens w per sed w h f rm h ca sod um hl d sol accord t ewm thod (4)

struck Three cats anesthetized surgically pre pared and electrically stimulated but not struck served to control the histological phase of the work Preparation of the spinal cord material and staining of the Nissl bodies myelin sheaths and a is cylinders were carried out as described in a previous paper on brain concussion (42) Some cords vere sectioned transversely others longitudinally in the coronal plane Serial sections were obtained from spaced regions of the entire

The method for staining the Nissl material of the nerve cell cytoplasm was designed to give great uniformity of results. It employs dilute solutions of thionin made up in buffers of pH 4 to pH 4 5 Staining is carried progressively to com pletion and lecolorizing is unnecessary Control and experimental mate ial of the present study vas stained together simultaneously

In order to facilitate the interpretat on of cell

changes v hich occurred in the spi al cords of the experimental an mals ve tral roots eresectioned intradurally in cother cats and the animals were sacrified 6 12 and 8 days afte operation Tyo or three roots we e cut in each animal and the series embraced the third lumbar to the first sac ral inclusive o one side o ly Control material as affo ded by the intact side of the cord and by portions of the adjacent segments c caudal to those cor esponding to the sectioned roots The animals were fi ed by perf sion with fo m ln acacia sod um chloride solution (4) The appropriate po t on of the spinal cords 1 as

serially sect oned log tud nally in the coro al

plane and the sections we esta ned by the method

for N ssl bodies (42)

PHYSIOLOGICAL RESULTS St mulation of the saphenou branch of the fem o all n e elicited refle contact on of mu cles supplied by the scat c nerve. A distinct foot mo ment w s chosen a the respon e for ob vation A blow pplied ve pp o mat ly the s th lumb spinal cord segment prod ced con cussi n the se rity of which w a crtam d by the mag itude of in ea e and the d ation of o eryt me of the threshold f the fine ls rate reflex The severity of the conculion mc with the strength of the blo Tie I gitud n I e tent fsp nalco d invled n co cus n upon gin blow lod pind dupo the stingth of that blow A blow p oduc p co cuss n t the seventh and ei hth tho acic egine ts did n t p ad suffi ientl t prod e c ss on of th rgo of the dn lved in the fen oral scate r fle re ffth lumbar t sec d sacral It re

sulted in hyperirritability of the hind quarters to saphenous nerve stimulation Blows spaced from the eleventh thoracic down to the third I mbar segments caused progressively greater increase in threshold for the femoral sciatic reflex Effecti e ness of blov's over the first and second c udal ver tebrae in producing concuss on of the reg on of the lumbar enlargement was much reduced

In the few times observed a femoral obturator reflex behaved just as the femo al ci tic reflex Contraction of the pl tysma muscle below the mand ble also resulted f om stimulatio saphenous erve A blow produc n concussi a at the 1 mbar enl Lement caused a rise in thresh old of this femoral facial effer. A blow producin

concussion at the seventh and eighth thoraci segments d d the same

Stimulation was applied in the pyramid to e ke hand I mb movement and slight forelamb move me t A blos at the lumbar enl gement caused ars of threshold f bind limb m em t A blow at the e enth tho e mentlikewiseread ily caused an crease alth ugh forelimb mo e ment m to nerves for which o iginate from cod segme ts cl se to the site of the bl w w s little affected

Occasionally an animal exhibit d consider ble general muscular acti ity on saphe s stimula tion A bl w t th lumbar enla gement com pletely b is hed this re po se whill le el f the e enth thoracic segment exti gu hed ly rostral to the le 1 f the blow

In o e to 1th of the instances in which co cus sion w s produced at the l el of th lumb r en larg ment the hind limbs immediately e t nded n ton c spasm la ting 5 to 5 se d The o c rrence of sp sm seemed to be u el ted t the se enty fco cu

Results form an mal with vaous nerves o p nal ord sect o d did not diff f m those d

se ibed bo e I stum lating the suphenous ners a w e f equency f on per s c d and early always a fall ng pha e of s ma were sed Co t ol

thre hold valus ( alus r coddbf e co cus s n) fr the fem ral cit cand i mo l'acial e fle es r g d from o t o 4 olt C cus thre holds tend d to greater then to olts St onger tinul w e not used In two-third of the in t ces theshild et mid to the cot i lues In the rest thresholds r t m d early t

c t l le l Reco ery was generally accompl shed in 1 to 5 minutes alth gh the time ra ged fom Issthan to 5 mn t Inge ld f I grad ll, th o gh the ecovery period

usually faster during the early p t

For stimulation in the pyramid a frequency of 100 per second was employed. Control threshold ranged from 0 to 50 volts. Other details were the same as those described in connection with saphenous stimulation.

o gross functional aberrations referable to spinal cord damage were seen in the injured cats in a period of 14 days after the concussion. There is the possibility, however, that the proper type of test would be early some abnormalities.

#### MORPHOTOGICAL RESULTS

Most of the animals which were struck one blow suffered no hemorrhage inside the vertebral can'l although many had traces of blood in the musculature at the site of the blow. Some had light ext adural or subdural hemorrhage but no intramedullary bleed ng In these and in two cats which suffered complete transverse fractures of intervertebral discs without any alteration inside the vertebral canal there were no functional indications of the complicating condition. A second or third hard blow at the same level often pro duced intramedullary hemorrhages or extensive subdural bleeding leading to compression of the cord Delayed effects of the e complicating injuries upon thresholds could usually be observed in such cases In 21 stances very strong blows pro duced fractures v hich lacerated the cord and pro duced fu ctional results readily distinguishable from those of concussion

Histological evamination of the affected region of the spin all cord of the animals perfused nimmeth atek after the blow revealed subtle changes among all nen e cells except the motoneurons. The "histological nen et cells except the motoneurons and the nucleolus was more often regular as compared to control material and as compared to more remote segments in the same animal. These changes were essentially the same as reported in the brat is of guineap g guipon c neussion (42).

The chief histolog cal alteration found in the spinal cord 6 has afte concussion \(^1\) as 6 mato is so fine to cells at a le el unde \(^1\) high particip is in this reaction were interneurons of large \(^1\) or the first of grey columns. Many \(^1\) is equivalent edges and \(^1\) and \(^1\) in the grey columns. Many \(^1\) is equivalent edges of degeneration \(^1\) ere found \(^1\) in \(^1\) may be seen in Figures \(^1\) to 8. The smallest interocurons are probably \(^1\) all affected perhaps \(^1\) en dimminsh \(^1\) in mumber but it is difficult property to \(^1\) essentially essentially cells \(^1\) essentially essentially cells \(^1\) as \(^1\) essentially essentially cells \(^1\) and \(^1\) essentially essentially \(^1\) and \(^1\) essentially essentially essentially \(^1\) and \(^1\) essentially essentially essentially \(^1\) and \(^1\) essentially essen

The long tu linal spread of this process of chro mat 1 s s an 1 tle numler of cells affected by it

were directly proportional to the severity of the concussion Following a moderate concussion many chromatoly zed cells were found within about a 3 centimeter length of cord For a distance of about 1 centimeter beyond either end of this region were found a relatively few scattered cells undergroine chromatoly is so

A comparison of the concussion material with spinal cords from animals in v hich ventral roots had been sectioned intradurally revealed two per timent points. First relatively few motioneurons (cells which under ent chromatolysis following severance of entiral roots) underwent chromatolysis following severance of entiral roots) underwent chromatolysis after concussion and these vere located with in a few millimeters of the center of the affected length of spinal cord. Second most of those chromatolyzed motioneurons found of days after crossion ver in a stage of degeneration far beyond that of motioneurons of days (or even 12 or 12 days) after ventral root section. Compare Figure 2

The only axis cylinder abnormalities seen in the spinal cord 6 days after concussion were some ter minal bulbous enlargements. The e occurred only in the more severe concussions and then to what would seem to be an insignificant extent. They were nearly entirely limited to the lateral funiculi in a segment of cord, 3 or 4 millimeters long at the middle of the injured region. The absolute extent of this pathology was o millimeters to r5 millimeters.

Myelm sheaths as studied vith the Weil stam were normal. So vere blood tessel. There was no proliferation of glia or transformation into patho log call glia in the injurel regions. Dorsal root ganglia dorsal roots and ventral roots showed no abnormabile so 6 lass after concussion even at the le d of most into sec chromatolysis within the spinal cord.

One cat was allowed to live indefinitely after sustaining it ree spinal cord concussions one of hich vas severe. The animal remained healthy continued to gro—and showed no abnormalities. At last observation 7 months after the injuries ve e inflicted the cat veighed 4.12 kilograms as against the original veight of 2.95 kilograms. Thus spinal cord concussion was not followed by solving progression experience in the spinal cord due to primary nervous tissue damage. It to vascular into dement.

#### DISCUSSION

It would seem that o e important f cet of spinal cord newsion is interrupt on of function of the cell bodies of the interneurons indicate a much lesse tent of the liver mot rineurons. Ce tailly

th 1 mb

ıЬ







th 1 mb gm t f th pin 1 d f t 6 d y
ft 1 ad 1 t f th rrespo dig t 1
Th II t th ribt t f foc × 575

it the interneurons which sho it epin cipal his tolo ical alte ations in spi. I co d concu sion and postconcussion and it ist i terneuron cells t hich fear the br. t of the fu ct onal and histot c. I chages i bran concu ion A bloo oce the lumbar enlargement abolishes the mot esp. s of the hind limb to a stim. I sapplied the py. midal tract in the po. s. This i mo. I kely de top. alyses of inte cu. o. hich py. mid i tractfiberse d (?) the ntop. also fine the more incurrent themselves. We recall that he had not on cuss on the excitability of the c. all motor nucleus was usually not at all or but I tile decreased

h le reflexes involving the e clei were no el e table (3) Since in bra n c n sion the fibe s were not blocked the seat of these refle d turb ance seem to ha e been the 1 term o cell. The pre interperments demonstrate that celement of c cu of the picod block of long ced g and desce ding nerve ibers. The different limited integrity of refiber little from the flunt to a limitegrity of refiber little from the different little from the little f

Of teet the bservato that som de geofteta fhdlmb crred n lyoe fou thof the cou o softhe g of thlmb enla em nt and the tetan dd ot o cur



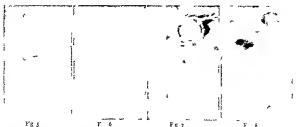


Fig. Chrom thy flg t the sale p tithed ligy lime the fifth limb segment the p land 6 d l cated y ft ff p land 6 d l cated y ft ff p land 6 d l cated y ft ff p land 6 d l cated y ft ff p land 6 d l cated y ft find 1 mb gas t fth p land 6 d l ft d y ft fth d l gas t fth p land 6 d ft fth p l d x ft

p t fd lgr j m ' thlmh gm t f p' d x6

Spinal cord concussion at the level of the phrenic nucleus or highe would perhaps lead to fatal ar rest of resp ration. We have made no study of the effect of high blows hecause the topography of the cervical region pract cally precludes the possibil

ity of uncomplicated spinal co d concussion

m dium m ll

d Th

m II

1 gr y

Ch m t lys

n fth p

th 1 mh

Fg & Ch m t l

t lp t fth d

m t fth p

hrm tly d

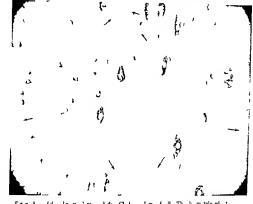
in any concu sions of the midthoracic region. If the conduction block in ne ve fbe s hich we demonstrated was analogous to that which K ems Schoepfle and Erlanger of served in the d ssected sciatic nerve of the green frog compre sed by a blast from an air p stol we shoul I have e pected to have obtained bette evide ce of the mmediate d scha ge hich preceded partial or complete block in the r preparation and of the repetitive sp kes initiated in the blocked fibe s If the s ne qua or of concussion is a depolari ation of ner e cell mem branes with resulting massive discharge as W lker Kollros and Case have stated e should ha e ex pected tetanus of hind limbs to ha e been a con stant concomitant of concuss on of the spinal co d in the region of the lumbar e largement Since tonic spasm when it did occu was not clearly associated with any m g itude of blow o se enty of block it cannot reasonably be said to ha e in dı ted concuss on

There I reason to belie e that spinal cord con cussion as suffered by man im one severe in its phys ological aspects than in the cat. In the cat a midthorace blow does not alter the threshold for the femoral sciatic reflect but in man it probably outdoor to the much greater depth of pinal shock to which man is subject. Perhaps I tervention of spinal shock can in some way lengthen considerably, the period of functional recovery following a reversible spinal cord injury in addition there is the possibility that spinal cord concussion can be more severe in man than in though the period of the preater stren in the boratory animals because of the greater stren in

All evidence 1 d cates that the loss of Niesl lodies in postconcuss on is directly of rable to plays cal mjury of the cells sustained at the 1 me of concus ton. In hoth brain concuss on and spit acle rd concusson morphologicales dence of this immediate plays call mjury may be seen is a ubtle mit reutional dosoga teation. The postconcus stonal chromatolysis is clearly differe t from that following account on a spit va. Ft all, the e is usually no evidence f inflammation f flow it genomes in a concuss in

greater fo ce that can be applied to the nervous tissue it bout producing complication. A majo aim off the present study is clarification of the te m concussion. Persistent use of it to co er traumatic injuries of the hrain and spinal cord displ. ying the most diver e clin cal and path old call dings has greatly muddled thinking and the most diverse clinical and path old call dings has greatly muddled thinking and state of the product of the state of affairs is middly indicated in so cent and excel lent a book as fig. 1 is of the Skill. E aim and Spinal Cod. ed ted by Brock. where different

of the e teb al column and consequently the



ΓggA fd lgylm ldrClk Imfil Thhm tolyed t tth t lft t Clk l Adthmthd l × 4

r te used c cuss on n diferent senses and the ed to found it cessar to add e planator, r maks and g d g notes at se e al pl c Th sh uld b corrected t arb tra h but p c ti al and sound bas

If the tem concussion is to be applied to b th ban and spin locard injures let the fu cto l ndp th local b fo application the two instances be as a million pishl. C c sisting of the ban has b shown to be a state mm d attely ll w gapplit the fad quitefet of the bran as ten he chieffs the interneution en pictated es it ghat a sent paysasse en thou him lomotorium let ess lly not

fic th affected Stru tu alatteration n in terneurons ha b n demonst ted u c c sso and chomatolysis has been hown to c u the c kpost neuss np od E eptforfib rd magesomet mesperceptible m kp t cuss on this to etent f th pathology m and fter smple concuss on of the br m (4 14)

Earl b the linc lade type sime tal p t pp ed in which tam t him hes co t sons dle tions w inf dwth o sso d more o le e e degenerat proc e es f low mj vere d c bed der the headm c ne sso nof th b m O thoth h d the e w those vrt who bele d that c cu ion f the hum n b an w m ked by bref ne sc u ess and chefin pa alv effect u compa ed bv y a atom l ha e Thi I tter tew a stept w rol od lass ne

tto fhed je t at haerp tede Maype s per ments a dp tient n wh h pr al co d on cuss on w s d stinouish d ot at 'll rolv fig rat elvf mt m tich mo rhag ont s l eratios dis er deg t ep esses B t the little in thite tret indicat that s oe erth htd fint loof pale deocu son a ar er bl mjr with o at mical bass Thio ea on t failt gew the true at r of pin lc dc cu o asabn f spinal cod bl k with tib a d terneu ol ement Kn ht pp oa hed this u dersta d g wh be w ot th tu compleatel cus of the pmal od wll esole completely wth

tme btfth c cuso m ks nd ! g

contusion the signs of the latter injury will become manifest as concuron passes off Pecovery from the symptom of spinal cord concussion in humans according to Knight may occur with n 24 hours

or be delayed for a yeek or more The indiscriminate use of the terms spinal cord concussion or spinal concus ion aro e in and l'as been perpetuated by uncritical clinical patholog ical and experimental observations. Pathological studies in man were all on severely injured pa tients or el e were not judiciously appraised from the etiolog cal standpoint. All or part of the le sions found were assigned to concussion. In the laborato v very severe injuries vere inflicted on animals a divere called concussion. No ade quately correlated functional and histolo ical experimental stud e were produced. Con equently no one knew what sort of pathological picture a recovered case might have displayed. In addition the attempt was never made to dissociate early functional disturban es from e cess pathological changes ie to d cover the maximum functional aberrat ons which could occur vith the minimum anatomical alterations. Hence in the claim and in the labo ato y tra ma which affected the spi nal co d v ithout grossly ontus no or lacerating it was said to result in concussion regardless of the real nature of the lesions If the spinal cor 1 v as d rectly contused or lacerated by a missile or bone fragment it v s still said to have suffered con us sion adjacent to or e en remote from the directly contused or lacerated area if the e other parts showed any patholo acal changes In this way con cussion came to be used as a very nonspe fic term and that was most unfo tunate the u e of other more pecific te ms as pass vely discouraged

Enchsen wrote in \$50 (ist ed it \$3) that there are four forms of le ons leading to fatal results; cases of spinal concus ion (i) hemorrhage with in the spinal canal ()) lace ation of the men branes of the pill cord and extrasion of the med ultras substances of the pill cord and extrasion of the med ultras substances of the spinal coil a \$4 (d) as integration and pe haps inflammatory sof tening of the pinal coil of Erichsen all o mentioned molecular disturbance and nemu as causes of concussion. Further he included as spinal cord concussion. Further he included as spinal cord concussion reason in which injury was remote per haps not even affecting the ertebral region followed by general nervo used case and injuries in fowed by general nervo used case and injuries in

which have more thank the symptoms were delayed and ranasis of see Gunshot in jury of the spinal cord. The survival time as 5 veeks. There was an extense e area is stening and widespre didegeneration the lalic of

Page m 18b5 ( sted 188 ) severely criticized the writin s of Erichven and others. He was of the opinion that their reports were based upon faulty interpretations and that there was no evidence for their conclusions. However he contributed nothing constructive to the knowledge of soil all cord injuries.

Spiller reported fatal injuries in a kitten (30) and in a human bein (40) which he called concussion of the spi al cord Pathological alterations vere injuried the hemorrhages and Marchi degeneration. In the kitten there were alterations of the anterior born cells.

In 1900 Hartmann Jublished a paper on uncompletated traumatic spinal cord diseases. The title is somewhat misleading because by uncompile to the watcher meant all the cases in which there was no persistent injury to the vertebral column such as fractur or unreduced dislocation. Symptoms set in at once or were delayed. The pathology included primary and secondary fiber degeneration bemorthages foci of necrosis de generation of anterior horn cells root degeneration glis probleration blood vessel changes and meningeal in ol ement. The blood vessel changes were considered to be very significant and to be at the root of much of the other damage.

Holmes Claude and Lhermitte (5 6) Lhermitte (26) and Ferraro (11) repo ted on spinal cord pathology n soldier in whom the vertebral column was injured by a projectile vithout the sp nal co d receiving a direct wound. The cases were spoken of as concussion Clinical symptoms were those of total or subtotal transverse cord le sions All found foci of necrosi cavitation acute p imary degeneration of nerve fibers and glia pro I feration within seve al segments of the level of injury Besides Claude and Lhermitte (5) an I Lherm tte (26) found spinal nerve root degenera tion and alterations of the central canal They decla ed that the bodies of nerve cells of the gray substance sere remarkable in their resistance to con uss on In add tion Ferraro (11) found focal hemorrhages and changes in the wall of bloo J es els Holmes al o found hemorrhages

Mathu g (30) and Marburg and Ranai (31) de scribed the pathology of the same type of ar in juny c ses but refra ned f om applying th nam concussion to my of them. The most important change. Marburg belie ed 1, as an alteration in the alls of blood essels leading sometimes to occlusion. He felt that most of the other pathol ogs was the re ult of vascular alterations.

Mott referred to a case as sp nal c neussion in which there was a par lysis of arms legs and in tercostal muscles t bether that esthesia below

the seco deers callered d ath followed in a days. Extensive meningeal and intramedullary hemorrhages were found. The cells in the phrane huckens at the fourth and fifth certical segments were entirely destroyed. There as vacuolat on of mydm and s. elling of avis cylinders at the seat of the injury.

Hassin (16) reported as concussion of the pinal cord a case in which the patient tripped over a wire and fell striking his right shoulder. He arose and resumed vork. Weakness of the right hand vas prese t 4 weeks later and by 11 months both arms and legs ere veak and showed wasting The patient died of pneumon a 18 months after the fall and shortly after a laminectomy which had revealed no evidence of fracture di locatio i or dur il lesion. There were w despread degenera ti c changes of the anterior horn cells as ociated with proliferative neuroglial afterations. There were micro conic foct of degener tion or oftening in the anterior horns in the lower cervical region The poste for horns a d Clarke's c fumn showed practically no nal cell Fiber d ge eration v s tound in the late I columns invol ng the late al corticosp nal tracts the late al limit ng ones and Go er stracts The fiber l o svere said to be secondary to the cil lesions tie delicate cell suf fering most from the jar. Has in attr buted the lo onset and progre s e cou se of the clinic i ymptoms to the time necessary for nerve fibe degenerat on to become manifest in thi (16) and a late paper (17) H sm te ed the dence of concuss on of the sp nal co d even far away f m the reg on d rectly affected

Davison and Keschner thibuted to concus on the f ci of n osis v h ch they found at vary n d stances below the primary le ons in cases of

comp ession f actu es

To cas no e th patient dying f sepsi in 8 days nother the furem na days formed the 1 sis for the statement of Bald in that primy and ndary degenerating no nerve fibes for of ftening ind de truction of vent al horn cells rein nifestations of color of the spin 1

Sche lident f dasconcu na ae nwh hiemot sympton solim b weaknessandat phywe e of g dual onset and pog ess e eo use. The p tent succumbed t e pratory par h s o months Fib degen at appeared in p riphe e lnerv. In do sail root g in la the ner eli we e p tealth normal and the pst e ts we e only lighth soff ted. But n the intercots e ret here de near no occur d W d speads e ref fibe de near ton and che m toh so go anter or home ells were fund in the spinal

cord Many I the essels througho t the spial cord eccongested Diapeds of red blood or puscles was found associated with vessels shown degenerative change in the endothelium

CI tton Clark MacDon all Harima n and C sam no II eq o ted as concusson until uses in which back trauma was followed by pa plega lo s or impa rment of ensation and rete too of utton. The symptoms be an 1 regress in a fe days of recovery 1 as ne rly complete mapport immately 2 to 6 weeks. The delayed recovery use probably dicate the the inj ness were comprobably dicate the the inj ness were comprobably.

sion plus complicate n
As has been implied pre to sexperimental of has n there of a din liss six in ord signing mate injurie to the spinal cord. The web of Schmaus in 1890 p. pp. tin to be o punal coid concussion conside bly influence debogstrinh field. He cited fatal casses of the Phum Bears a d.a. cat to show that the fiber of ene ton which is found in the panal d.a.t death some time after injury is primary and is not due to some g. selesion which interrupts the fibers. B. ides its fib descript and the ewer the selections in the significant production of the constraints of the constraints of the constraints of the constraints of the selection of the constraints of the

fects a softening and cavitation. He p od ced penal cord juries abb t be st ling repeated blons on a board Lud on the back. It shald be mention d that the meth d of prod cin 1 jury by any rep ted blows first used by Ko F ad Fil line in 874 in b in injury studie and bet quently employed by oth rs in pinal co d n est g tions has no p act callb s s In Schmau the tau natization w se teme ou ils bl s del e ed o er ap od of a few or many days H mad no fu the studie nan nbe f animal h h seemed completely rec ered fte the traumatizati n vas topped. In most c ses la time p ral si of the h n l l mbs e lied and atroph appea ed fite the s and week. This an mal er sac fied or ded to 44 days after the I comming of the exp unent. The thera ce on of the ord as stud I hefly In s m the ewe no histop th lo 1 f d fiber and ell In g ne al the a mal which ga e the e new t e esult were those wh hh ed o h a hot tune In the tall ante or h m cell f the pn I cord h wed ha e wh h th autho her t ted t int pet He tho ht the mi hthen rm l for , ung nimal o m ht ind cate a mol cula oncu sional hange in the cell The grate tch ge wa prim ry d e f ti b fnerve fib r P sent al we suhdu al hemor hage catt r d t medull rs hen rrha es sol tenin a sofglos ndcantsfrmatin Se alof the bb ts aloh d pne m 13

Kirchmesser (20 21) laid a rubber mat on the back of rabbits and struck repeated blows with a hammer on one or several days. Fi e animals were killed and one died after 8 to 13 dass. These were studied by the Marchi and the Weigert meth Five had suffered complete paralysis with partial or complete recovery These showed ex tensive primary degeneration of nerve fibers at the level of the blow and ascending and descending degeneration elsewhere. In a sixth animal which hade hibited brief tetanic spa monly the changes were not as great Two animal with different de grees of trauma and paralysi ere killed r5 to 1, days after the start of the expe iments and the material was used for Nissl and for Marchi prepa rations Fiber degeneration was severe but cell changes were considered by Ki cheaesser to be practically negative and capable of plays g only an incidental seco dary role to the strikin, fiber

chan es These injuries were all called concussion Jakob produced spinal cord trauma and al though he did not specifically designate it con-cussion others have done so. The injuries were p oduced in rabbits by st kin, hammer blows against a board laid on the back. Two to r2 blow were delt ered on 1 or 2 days In 3 animals which died within half an hour there were no changes in the central nervous system ex ept hemo rhages but the liver was runtured in of them In 3 ani mals killed ar to 32 days after the hrst injury there were extensive primary and secondary fiber degenerat on variable de rees of softening and hemo rhages a few scattered degenerating cells and hease ganglion cell degeneration at the edges of the softenings and around the widened central canal In an animal killed at 45 days there was secondary degeneration of fibers and in one killed at 4 months there were degenerating fibers and fre h hemorrhages The e last 5 rabbits were par alyzed in the hind quarters for periods ra ging from more than 1 day to r days T o n mals were each dealt two light blovs which p oduced short tetanus of the hind limbs w thout ndica tions of paralysis they were killed 2 days late There was widespread d fluse fiber degeneration but no cell changes. In one of these animals the e

were a few small hemor hages in the sp al cord Matmestor rep ried on eyeptimental concus so all lesions produced by e posing dogs to gun cotton explosions. Lesions were most acute in blose animals which lived 8 / hours after the milder animals which lived 8 / hours after the milder speech spinal cord punctate hem hages were especially numerous in the ant ror a dimid gray sub tance of the thoracire ego in Nerve cells enclosed in these hemorrhagic foci were un dig no in the mindly size which we have the small per opend

mal vessels were congested and the central canal was mregular in contour. The cells of the spinal gangha were normal despite hemorthages about the ganeha and in the neighboring portion of the dorsal roots.

Marret and Durante produced so called concus sional lesions in rabbits by exposing them to the detonation of explosives Early lesions in the spi nal cord consisted of slight pial bleeding perivas cular ecchymoses more abundant in the white than in the gray matter and hemorrhages in the roots Fiber changes were described but whether they were a tifacts or true concussional alterations was left open. There yere no changes in nerve cells of the spinal cord or dorsal root ganglia. Some animals vere allowed to live for v to o months They showed no abnormal beha for No macro sconic le sons were found. In the spinal cord there appeared to be a size inequality of the anterior homs and a diminution in number of motor cells many of which were small and without processes In so ne cases fiber changes were seen near the peripher. There was no secondary degeneration in the white matter

The work of Roussy Lhermitte and Cornil is one of the most misleading publications on con cuss on of the sp nal cord These authors first re ported on the results of direct trauma against the vertebral column in 6 guinea pies and r rabbit The an mals were struck two to four times in the thoracic region. The injuries were severe not only involving the vertebral column and spinal cord but al o the vi cera and ribs. The authors had trouble obtaining mate 1al for histological section ing because of the mort idity of their animals. The animals u ed we e saved as long as possible but their poor gene al condition always necessitated their acrifice The thoracic reg on of the spinal cord was studied microscopically In 2 guinea pi s kille l 15 to 20 minutes after the blows there was said to he acute prima v degeneration of nerve fibers in the per pheral region -axis cylinders were hypertrophied varico e ir evular and very frag mented and myelin sheaths were distended-and the neuroglial mesbes were dilated. Two animals which had brief paraplegia and abnormal reflexes and we e kille 17 and 8 da s after the first blow showed acute primary degenerat on of nerve fibers in the marg n l one d lated neuroglial meshes but no changes in the gray matter. In I guinea pg and 1 rabbit killed r3 and 3 days after t au ma there were macroscopic regions of softening which in croscop cally proved to be a eas of e ere dege erati n and necrotic foci affecti g practically the whole cross section F nding were negative in a guinea pig killed 5 months after njury. The authors stated that findings in human pathology are the same-foci of 1 sular necrosis and acute primary degeneration of myelinated fibers the latter mainly in the peripheral region. These le sions they stated affect one or several segments of the cord at the level of the blow this ou te ob viously seems to be a guess. The authors also re ported a dog which as subjected to indirect trau ma of the vertebral column. It was fe ed with its back tightly against a board anesthetized and t el e violent hammer blows were struck agai st the board The animal showed no ab o mal's gns then it at akened an lin the follo ing days seemed completely well. Two months later it became gen erally emacrated despite norn al food intake. The vasting vas progres ve and 6 months after the trauma the dog was described as kin and bones Still there vere no neurological signs. The ani mal succumbed to the cache in The spinal cord y as absolutely normal upon gross a spection. It s as stained by a method for Nis I bod es The an terior horn cells were frankly atrophed. The author stated that these fi dings suppo ted the thesi of Kirchg esser ( ) that the intens to of the cellular alterat o s v as in ersely (sic) p opotional to the violence of the trauma | Kirchgaesse propounded o such theory. The co tended to have shown that trauma dire the on the ve teb al column attacks chiefly the my elinated f bers of the hite substance hile ind ect traum of the e

column attacks cheen) the mysenhatear bers of the substance hile and ect traum of the etebral column inju es the co d less i tensely p oking c ll lar les o s mo e read ly Fe (r) cond cted hi tolog cal studies y hat he called p nal cord concussion in 9 rabb

that he called pinal cord concussion in 9 rabb t k lled I hour t o day after be g struck on the b chaith ni on rod Sections ere t med with il ne blue and o a ge G. In his one hou a imal h eported loose ppeaa e of tss e n plac s slight enl gement of some neuro | cells sharply dem cated areas n tle h te matt of deeply t med enl gedandd fo meda vhodes th swoll n myelin shaths occa n l ry m nute foct of n c 0 in the g v matte me erve c !! d epiv sta ned chromatin b d es lls c nde deither alog thep iph ru nt ally lo of the cell b dy r su ound th ated n cle n cleol met m s d l cated aln th uclea p phery nu fibrl atd and d cell I tulm den d H 4 hou nml h ed n ddition t the b mewh tgreat ha e nrvefib nd lls cyt plasmi e la g nent of p nd m l ell fe m llspots of o m reduct n In the nd e II ha an mal then refib d ned the enect tss wa eladad th ked bld

walls ve e thickened due t relayati and the t ere degenerati e changes in spinal cots espe cially the poste or There ere no les ons in the spanal gangla In the r d cular one of entra ce some of the ax cylinde sended in e l eme t so called Schmaus bod es In an 18 hou anim! the lesions vere mo e severe. There we e empty holes left by degene ated axi cyli de s Th nu cleol 5 v as occa on ally displaced int the vioplasm in nerve cells. În 30 4 a d o ho rani mals degeneration in the thite matter as progressively more advanced. At no hours degenera tion vas diff se and intense At 6 days th ws a propo ced neuroglial reactio. Verve fibe de gene atton w s more advanced many aus cylin ders we e gone thout trace and o m c reduct o was pronou ced Nerve cells espe lly th terior horn cells sometime showed the a

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#### SU IMARY Sp nal c 1 con uss on s studied

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blw ppld er pp mately the thlumbar spnnlcd gmetpd doncus o the ty of which a m s d by the might de of eace a d the d to fe ry t me of the threshold for a femoral scatte reflex. The seventy of the concussion and the longitudinal extent of spinal cord in olved increased with the strength of the blow. A blow producing concussion at the seventh and eighth thoracic segments did not spread sufficiently to produce concussion of the region of the cord involved in the reflex. Blows spaced from the eleventh thoracic down to the third lumbar segments caused progressively greater increase in threshold for the femoral sci atto reflex.

A blow producing concussion at the lumbar en largement caused a rise in threshold of a femoral facial reflex A blow producing concussion at the seventh and eighth thoracic egments did the

Stimulation was applied in the pyramid to evoke infind limb movement and alg ht forethinb movement. A blow at the lumbar enlargement caused a rise of threshold for hind himb movement. A blow at the eventh thoracci segment likewise read ily caused an increase although forelimb movement more increased in the properties of the hold was little affected.

Occasionally an animal exhibited cons derable general muscular activity on suphenous stimula tion. A blow at the lumbar enlargement completely abolished this response while one at the level of the seventh thoracte segment extinguished it only rostral to the level of the blow

In one fourth of the instances in which concus since was produced at the level of the lumbar en largement the hind limbs immediately e tended in tonic spasm lasting 5 to 25 seconds. The occur rence of spasm was unrelated to severity of con cuss of

Histological studies were rigorously controlled Examination of the affected region of the spinal cord of animals perfused immediately after the blow revealed subtle changes among all nerve cells except the motoneurons The chief histological alteration found in the spinal cord 6 days after concu ion was chromatolysis of nerve cells at a level underlying the external site of the blow The principal participants in this reaction were interneurons of both dorsal and ventral gray col umns A comparison of the concussion material with spinal cords from animals in which ventral roots had been sectioned intradurally revealed 2 pertinent points. First only relati ely few m to neurons (cells which underwent chromatolysis fol lowing severance of ventral roots) undervent chromatolysis after concussion and those were located within a few millimeters of the center of the af fected length of spinal cord Second most of those

chromatolyzed motoneurons found 6 days after concussion were in a stage of degeneration far he yould that of motoneurons 6 days after ventral root section

Uncomplicated concussion of the spinal cord in the cat then sa complete functional block of the spinal cord at the level of application of an ade quate force to the nervous parenchy ma. Nerve cells principally interneurons and long ascendings and descending fiber tracts are into level. The period of concussion is hiref passing into the period of postconcussion when the paraly six cases. The much greater depth of spinal shock to which man is subject perhaps adds to the profoundness of the functional alterations in man. Subtle but his tologically demonstrable cell alterations occur in concussion and frank chromatolysis is evident in postconcussion as a direct result of the physical injury of the cells sustained at the time of concussion.

A review of the literature on spinal cord concussion supports the statements that the term concussion must be clarified and that many ofthe recorded observations on spinal cord concussion are of questionable value. The functional alterations with their attending histolo cal changes which we have described in this and in other papers ment a specific designation. It is to these injuries of the brain and spinal cord that the term concussion should be applied and to these alone

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### IMMEDIATE SKIN GRAFTING FOLLOWING INJURIES

M K KING MD FACS No folk V ginia

OUNDS which can be surgically cleansed debrided and closed with in 6 hours after injury usually heal by primary union This applies to compound fractures as well as 1 nurges to soft tissues The secret of such healing is surgical cleans ing and is dependent on no anti eptic or bacteriostatic drugs. We have adequately demonstrated this principle in treatin several thousand injuries over the past 10 years Before the introduction of the sulfonamides we routinely closed compound fractures and other injuries when they were seen early

In war wounds such treatment : not recom mended There is neither the time nor facilities ava lable for the meticulous clean ing and debridement necessary in these first few golden hours On the home front most patients vith in jur es come to the hospital early and the conditions are such as to make closed method of treatment

safe and practical

To be successful cleansing must he thorough Every particle of foreign material and devitalized tissue must be removed from the wound. This treatment requires time patience adequate anes thesia and plenty of soap and water A stiff brush may even be necessary to remove dirt ground into the end of a bone or the hone may have to be cut back for a short d stance Unless one is certain that all dirt has been removed it is safer not to do a primary closure

We have some additional safemards in the sulfonamides when they are used in addition to and not as a substitute for surgical cleansing Sulfanilamide crystals is the usual drug of choice It may be frosted into the wound just before clos It undoubtedly has decreased the incidence of infect one in wounds when properly used but it should be stated most emphat cally that sulfa mlamide will not prevent infection in a dirty wound

Primary healin frequently means a sav ng m time of weeks or even months. It means decreased hospitalization and expen e It means minimum pa n and deformity with maximum functional

Unfortunately many wound cannot be closed primar ly becau e of loss of soft parts or because of swelling By means of kin grafting many such From th U S. Maran H sp tal, N ri lk, V rgs a.

wound can be closed and primary healing achieved A few examples of such injuries will be discussed

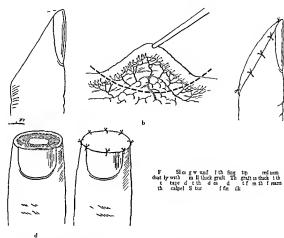
#### ARRASINE MOUNDS

This type of injury is usually produced by con tact with grand ng tools by being dragged over a roadway or hy contact with a movin cable or rope The wound is painful and dirty and the dirt is ground into the underlying tissues

Treatment consists of thorough surgical cleansing under adequate anesthesia and covering the surface with a partial thickness graft (Fig 1) I ocal anesthesia is inadequate Pentothal is usu ally very sat sfactory The wound is covered with ste ile gauze until the remainder of the limb is thoroughly scrubbed with soap and water and ether The wound is then irri ated gently and particles of dirt and devitali ed tissue are removed with forceps Sharp dissection should be used when necessary A small continuous stream of sterife water or saline facilitates the cleansing Cfeansing and debridement should be continued



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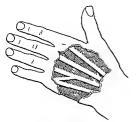
unt l one has a surg cally clean vo ad with only

Finally the surrounding area spainted with merit loids and the vind is draped with sterile sheet. A partil I thickness skin graft is taken for convenent area suffice in to ever the wound. The cutting may be dine with a kinfe or are but the P d ett dermatome. If a super or free ening! rgs a as Furthermore the grafts are mor uniform is in and the chiefs and there is less damage to the donor te. Ag. It of oo 4 to oo 18 nch i easy thand! g es a good cos metic esult and le. es a donor site vihich le is any dly with ot scarr g.

Bef re the graft sappled the wou dusfr ted lightly with cryst line sulf inlamade The grift s sutured in posit n und shight this on by means of fine silk on n at aumat c needle A quilting patt m f sutures used to b me the graft int firm app it n with the unde lyin bed and these sutur s dec ease the need to ccu

r tely applied pre s e postoperati ely (Fig 1 b) They als allow serum to escape and by ate the necess ty fo cutt holes in the eraft. It does not matt rif a few islands f the riginal skin are pre ent ben th the g ft When s turin s om pleted the while rea is am spri kled lightly with sulfatul mide crystals a gauze sponge satu r ted with sterile glycer e s pressed down firmly on the graft and b lky gau e dr ssings are appled Mode tep ure is mantaned with ad hes e stroppin or el ste badge. We hae f und speci I dres ngs nnecessary Mech mcs w ste tool mpy d gives nune en p es ure Th outer ires in sa removed ny days and if the wound s clean a d dry it is edressed a d after n the 5d 3s the st es ar remoed

If the details o threed ar f llowed a roo per cent tak of the graft should be bt med Heal mag time; greatly short nei die o mf rt; man mured nd the c smetic esult s cellent in this nethod of it eain mt.



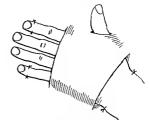
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#### SLICING WOUNDS OF THE FINGERTIPS

Shong injury of the fingert ps 1 common in those we kin with knives sharp-edged tool or machinery. If the wound is allowed to heal spon aneously it means healing by granulation and almost always results in a tender or pumful scar Vany patients will return later requesting ampu attoin for relief of these symptoms. If p imary closure is attempted it is necessary to shorten the bone in order to secure an adequate 4.8m figar

Immediate application of a thick skin graft to the wound will give rapid healing good function and will avoid further shortening of the finger (Fig 2) The operation is a mino one and can be performed in the office o dressing room under procaine block anesthesia. The whole hand is thoroughly scrubbed Usually very little cleans ing of the wound is necessary since it is a smooth cut with free bleed n. Bleeding can be ade quately controlled by pressure The g aft is cut from the flexor surface of the upper forea m in the same manner as a large pinch graft A pattern is unnecessary for such a small graft. In females it may be desirable to use some po t on of the anatomy other than the forearm. The graft should be full thickness at the cente with I tile of the subcutaneous tissue nd tape ed at tile edges. It is sutured into position with fi e inte rupted silk Sulfanil midepowders sprinkled about the wound a glycerine gail e dressing appl ed and the finger bandaged under sl ght pressure

Rapid clean healing us ally follows the procedure and a successful take may be expected in over 80 per cent of vounds so treated Pain p c

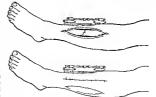


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tically d sappears after the graft is applied and whether the graft survives or not pain is greatly minimi edin contrast to that seen when the wound is left open. Indeed this is true of nearly all wounds treated by s. in grafting. A very painful burn will become almost painless once it is covered with skin.

#### WOUNDS LEAVING EXPOSED TENDONS

Injuries in which the ten lons are left exposed always lead to considerable disability unless



df fth tha tu ly 1 ns d dth fact du ect It ecessary t t th p oc d gh m ch Beca se f ld t be I sed t1 below Th d tth d with pulth kes graft from th thigh

promptly treated. The exposed tendons either slough or become embedded in deep c catrix. The hand is particularly vulnerable to such injunes e pecially the dorsal su face where the coverings are thin

Full th ckne s skin gr fts are essential to good function in covering tendons. The grafts al ould carry a mall amount of subcutaneous fat and areolar tissue. A free graft of this type does not take well when placed o er exposed bone or ten dons A pocket flap should be used for the hand

and a pedicle flap for the ankle foot or knee For the sake of bre ity we shall discuss one mury of this type a wound in olving the dorsum of the hand (F 1, 3) Meticulous surgical cleans in and d bridement are carried out and the injury is converted into a surgically clean vound free of devitalized tissue. The prep rat on a essentially similar to that de cribed under deep scraping wound I pos d nerv filaments should be care

fully preserved For the d nor site a varea selected in which the hand vill fit comfortably athout tensi n. The ante or abdominal wall or this has suit ble. A flap is raised of suffic ent si e to fit over the hand and cover the wound. The hand is placed in this pocket and sufficient sut es used to ancho the flan fi mly to the hand (Fi x b) A fe add tional stout sutures are u ed to anchor the hand to the abdomen or thigh Firm anchora e is mos mportant Movement of the hand under the flap s probably the greatest sin le factor in pr ventin a satisfa to v result. Bulky dressings and adhe s e st ppng giv addito al mmobliaton hen the operation s completed

One end of the er it is cut i ce in 71 od ys The free end t mmed a d fitted t the wound a d sut ed 1th fne s lk or de mal The othe end s feed in 12 to 7 days and the final stages of fitting a d ut n completed The d nor s te can u lly be clos d but if n cessary thickness graft in y be used to cover the defe t

Approx mat ly norm I to don funct on m y be spect of llo sing the method of treatment. The proc dure s equally applicable t secondary sloughs following nj ries o bu os prov ded in fect n is cl ed up b fo e graft g attempted

#### MISCELLANEOUS

In compound f actures f the fore rm o le + sometimes impossible to close the wound f llow ing operation Relaxing inci ions must then be made lateral to the wound in orde to brin full thickness skin and f scia together o The relatin incis o sinstead of be gleft open! granulate in may be covered with a split thickness graft (Fig 4) The technique of pplicatio is similar to th t de cribed unde scrapin wands. A graft of o or4 inch is sat sfact ry In this man me rap d clean heal n sas red with munimum di figurement

In a dirty crushing or deep lace ated wound it is sometimes ad isable t e c e the whol area thus con e ting it int a clean surgical ound F llow e cision it may be difficult or impossible to b n the edges to ether Ap tial thick ness graft taken f m an adjacent a ea may be used to con e t this nto a closed wound. The technique s m l r to that described except that in a deep o d greater care m st b tak n to brin the gr ft nto contact with the und lyin base Th s conta t is accompl shed chiefly thro h suturm with fi e silk and by the of pressu e d essings

#### SUMMARY

h the u e of skin gr ft ng many ope wounds can b con erted 1 t closed wounds and thus prima y bealin obt ned P mary healin means a t emendous economic savi as well as decreased pain mp oved fu ction and supeno

cosmet c results To be a cce sful Il dirty o d must be surgically clean before g fting is attempted G afts must be placed nd held n firm appos to with the unde lying t ssues The most comm can es of failure in skin gr ft ng are ( ) nfect

- ( ) blood r serum pockets be the the oraft ( ) nadequat contact b tween the gr ft a d its bed (4) improp r inadeq to a ch rage of the graft so at llow more ment d re the healing
- p tod Ava ety finju es redsc sdin som d
- th methods of g aft ng best s ted to each typ

## DICUMAROL THERAPY IN POSTOPERATIVE THROMBOPHLEBITIS AND PHLEBOTHROMBOSIS

WILLARD H PARSONS M D FACS V ksb g M s ss pp

HE outlook in postoperative pulmonary embolism which was formerly regarded as an unpredictable unpreventable and highly fatal surgical complication has been completely altered within the fast few y cars for two important reasons. The first is a cha ged concept of its etiology. The second is the introduction of effective prophylactic and therapeute measures includin leation and division of the femoral vein and more recently the u e of drumarol.

It is still true that in all surgical e pernence there are few more ghastly acc dents than the sudden death from massive pulmonary embodism fa patient who until the fatal episode has been progressing to an uneventful recovery. There is no longer any justification however for the former concept that the catastrophe is a fitteral bolt from the blue. It is not. It is not realized that in probably 95 per cent of all cases post operative pulmonary embolt which term nate trially have their or in in thrombos often without an as ociated inflammatory factor of the superficial or deep veins of the lower ext emittes.

Both the incidence and the causation of postoperative thrombia ers still matters of debate. On the surface at least geography seems to have something to do with the incidence. This Affen-Lution and Donaldson report a very high fequency in Boston while Ochaner and DeBakey report a considerably los er incidence in the South. What is import in however is that wherever the condition has been prope fi studied the incidence has always been found to be much higher than as once believed or this is befreved and taught in many cities at the present time

The incidence of postoperative th ombosis gardless of the locality i all as id cith relt id to the proportion of necrop es secure l When ever the proportion is light there is a corre pin agh high neithere of thrombosis of enso of the lower extremities and of pulmonary i factions a data pulmonary emboli. When it ep ecentage of necropiases is low the incidence of e ous thrombosis and pulmonary infact it and of fatal p l

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monary embols is correspondin by small. For the past 5 years I have been able to obtain necropsies in about 75 per cent of all fast cases on my own surgical service and I have observed—on more than one occasion to my amazement and chagrin—a relativeth b h incidence of pulmonary embolism and of antecedent venous thrombosis. My experience in this respect I am sure is not unjoue

Afthou h there is no general agreement as to aff the causes of venous thrombosis certain causes are established including (1) improper handling at operation of the viscera and their venous suppfy (2) confinement to bed with consequent in act vity of the limbs and in turn sloving of the circulation (3) some alteration of the normal bfood cfotting time the nature of which and the reasons for which remain to be elucidated. The compf catton is most often ob erved after surgery part cufarly upon the pelvic organs and pelvic infection either antecedent to or subsequent to operation unquestionably is an important cause It should be emphasized however as the follow in case illustrate that a nonpel ic ori in is not infrequent and that surgers does not necessarily p ecede the development of pulmonary embol sm

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Thrombosis () hether the bland thrombosis of homans or the phlebothormbosis of Ochsner) should be borne in mind as a poss birtly following any operative procedure and should be immediately presumed to crust if several days following surgery there is unexpected or unexplained low grade fever or if there is tenderness in the calf of the leg on dorsillerion of the foot (Homa: s s go). These two phenomena are sufficient for diagnosis Phlebography is not essential it is sometimes use full but it may be very nurses.

When thrombosis of thrombophlebitis has been diagnosed or is secrously, suspected exploration of the fenoral vain is a vise precaution. If pul monary infarction has developed it should be carried out without delay. Although a highly effective procedure e posureand exploration of the femoral vain with removal of the clot by su to are minor in their cope present no surgical hazards give ris to no complications and can be safely and quickly carried out even on a very ill patient.

#### DICUMAROL THERAPY

With this plan of treatment itself of farly recent development should be combined the admin stratum of the marol controlled by daily determ nations of the plasma proth ombin time. The effect eless of these measures is illustrated in the following case report

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The mbos softhe en of the lowe extr mite can be p ented in most case by etain pecution at op ation of following ope tood. At operation all min pulat is should be non ir umate and thee hid be specified for evenous supply. After peat on cite whating should be mintained in the lower etem ties by keeping him warm by their of ee e perfet by with the bayed appa tus and in olde pate its by the appheat nof night gib ndages. They phyl cite if a deamar list of alu as the following case pot indicates.

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The case is somewhat similar to a case is Zucker's se ies n which d umarol w used prophylactically because the patient had a pre your hi tory of thrombophlebits in prega of 0 e s ster had died of postpartum thrombophlebits tis and a second sist requ'red amputation of s lower extremity for the same reason

The discovery by Schofield of the part played by spoiled sweet clo er in the hemo shane diseases of cattle was followed by the solation and synthes s of its active principle dicommann and by the prophylact c and therapeutic use of this principle under the comm re al n me d'cumarol Altho h reports in the l te at re are still few the e seems no doubt of the effects eness of the ant c agulant Barker and h s asso ates from the Mayo Clinic who tested to ophylactically o ra 3 yea period in 1943 published their esults in 497 cases In 75 of these cases on the basis f ex st g statist cal d ta thromb sis or embol m might have be n e pected toccir ad 4 fatal ties from embolism might have bee et pected The e conditions ho e d el ped a only 4 in ta ces none of which t rm ted fatally Zucker h s recently eported 8 ca es in which d cum of wa used therapeutically nel din 9 nata ces of thrombophi biti of the l wer e trem tie nd 2 instances of postope t epl mo ary infarct o ll of the pat ents made complicated ecoveries

The rat onale of the form of therapy reduced to s me hat o existinglified terms my be stated as follo s Thombo a d sub equent embods me rga die of white e othe et ol got clors as illed occu becau e the mecha isn't blood of it git too effect e The se fatgumand if

delib rate attemp to edu e th efficie cy of the smech nem to the lower limit feafety by the admin tratin of an anticoagula tindir co tilid conditions ver a e tamp icd fitm

The plan of the py is to diminister a null dose of or 1 300 mill g am of d drum of lo lowed by daily d es of oo mill grams at g ne saxy to m ntain the plasma profit ment time thing to dop be cent of o mail Observates in the contract of the difference of the differ

tanks and cate that thromoso will amost current tank not or r fthe proth mb times long of than 27 seconds and the tible discourfite the admenst times for fide discounding times less than 60 second

Their policy is to use 35 second as an arbitrary standard when the prothrombin time is longer than 35 seconds d cumarol is administered and when it is less the drug is omitted

Zucker call attention to the importance of the endency (slope of the plotted curve) of the plasma prothrombin time which is equal to the importance of the absolute level. The time may be e cessively and dangerously lengthened if an additional dose is given while the per entage of normal is decreasing but there may be escape from the desired range if a dose is not given while

it is increasing Dicumarol for either prophylactic or thera peutic purposes is absolutely contra ndicated in purpuric disease of any type in blood dyscrasias with a bleeding tendency in renal insufficiency and in hepatic disease with which a prothrombin time deficiency is frequently associated. Even when these contraindications are observed how ever bleeding is always a possibility. It occurred in 47 of the 497 cases reported by Barker and h s associates though in only 18 of these in all of which it was readly controlled by translusion was it apparently related to the anticoagulant therapy In Zucker's series of 18 cases 5 patients presented microscopic hematuria in i instance associated with a petechial rash. In the latter case the rash developed while the prothrombun time vas 18 per cent of normal and in 3 of the other cases hematuria developed while the proth ombin time was les than 30 pe cent of normal

The speed with which the prothromb n t me may be e tended to dangerous level is well illustrated in a personal case

5 COS(H 4 8) 5 t m pl ty J 944 1 nooth tll t gu nal h 11 p oc Alth h f st y ốc t đ d a d pl blty th b th f d or ph d t t th n d diag os Ip lm na y m d m 1 th py th f bg dosag f3 milgrm O th f ll Thp(tplmpthmb(ml5d)J7Althhdmtdthplmptl t m 1 1b m l md 1 46 mb t m å (<sup>S</sup> ds)] dì m 1 5 d) м 71 lh d l 1 m 1 rs (04 mgm ) 1 hos { th I Abbott) By thit mp in mb ml 7 d) d im haffi i rit thafff 3 d ( m! 5 d) Th dy fi th pt i The dyfith peil IIp dth lftlg asdm 11d Otffll df 1 gd y dm

admit dwa to thid the fulfiff mild. The podd of J 8 lt4 highwand of the wind fulfiff mild. The middle will be seen a seen

The speed with which the prothrombin time in this case rose to dangerous levels and the rate at which it continued to increase for 72 hours after the drug was discontinued sug est that the patient was particularly susceptible to dicumarol. The even greater speed with which it returned to a safe level after a single administration of synthetic vitamin K suggests that this method is probably even more effective than transfusion which is usually advised.

It should be noted that in this case the thrombophebits followed rather than preceded the development of pulmonars infarction or more correctly became evident after the development of pulmonary infarction. It should also be noted that it became manifest while the patient was under treatment with dicumarol. Zucker who recorded a somewhat similar instance regards the development of the venous thrombosis under such circumstances as e idence of the safety of d cumarol therapy, though it also he believes raises the question as to whether hypoprochrombinemia achieved by dicumarol is sufficient to inhibit intravascular clotting.

Dicumated therapy is potentially dangerous and the necessity of laboratory control by daily plasma prothrombin determinations cannot be over emphasized The possible risks are illustrated in the personal case just described (Case 5) and are more tragically illustrated in the fatal case re ported by SI levin and Ledere Their patient a white woman 79 years of age was first seen 4 s eeks after she had been admitted to another institution for thrombosi of the right retinal ten for which she was treated for 21 days with daily doses of 100 mill grams of d cumarol Du ing this time no plasma prothrombin determina tions were made although the coagulation time was eported as 20 minutes Dicumarol was dis continued 4 days before the patient was first seen by Shle in and Lederer when bleeding from the gums had occurred It had pers sted and had been associated for 3 days with hematuria

The patient was gi en y transfusions after the first 30 wh cho on gn was temporarily controlled. The plasma prothromb n time which was 60 6 seconds (control 12 2 econds) when the patient was first seen mose to 360 seconds plus (control 13 seconds) on the 8th day of hospitalization after the 4th transfusion and was 84 4 seconds (control

12 8 seconds) v hen it was last determined. Acute left heart failure developed after the 2nd trans fus on and anura on the 4th day was succeeded by incontinence lethargy and coma. Death occurred on the 14th day. At this time there were ecchymoticareas on shoulders hips legs and about the anus. The outstanding feature of the necropsy findings v as marked engorgement of all blood vessel except the larger truths it was most prounced in capillaires arternoles and venules.

This case apparently the first of the kind to be reported carries its own lessons and makes clear that too many precautions cannot be taken while dicumarol therapy is being administered. For this reason it seems well to mention the recent warning by Hurn and her associates that thromboplastin is distinctly variable under certain conditions and that each ne batch regardless of the s milar ty of preparation, should be checked since the results of the prothrombin time test depend to a great e tent on the activity of this agent. As these workers point out when the Quick test was first introduced all information desired was whether or not the prothromb n time was prolonged With dicumarol therapy however the patient's safety depend upon kno ledge of the exact amount of deficiency hence the necessity of check ing the activity of thromboplastin used in the test

On the whole dicuma ol is a mo e practical drug for general use than heparin which was fo merly the only effective anticogul in a ail able. It can be given by mouth whe e sheparin must be given in the end of she discount of the end of she are the end of the end of

that in a certain small proport on of cases hepana rather than dicuma of is the preferred drug

#### SUMMARY

Pulmonary embolism is pre eded in the grait majority of cases by th ombosis of the vens of the lower extremities which can usually be pre e rie by the proper p exautions at ope at on and air ward and which can be treated by remosal of the clot from the femoral ven with ubsequent lay to an and division is piper inted by the administration of dictional of Diction of sales a valuable proporbilactic measure.

In spite of its eff cti ene dicumarol the esent al effect of which i to l githe the clotting time a ery d ge ous age t which sh ld never be employed without deq ate cont of in the form of da ly estimations of the plasma

p othrombin t me

If the plasma proth ombin time becomes dange o sly lengthened as may happen even in prope ly controlled ea es in a subject pet lly susceptible to the drug the administration of a vitamin K preparat on or transfusion s indicated and seems promptly effective

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# THE EFFECT OF DIHYDROTACHYSTEROL ON CERTAIN TOXEMIAS OF LATE PREGNANCY

WALLACE SHUTE Capt n R C A M C and EVAN SHUTE B A M B FR C S C
Lond C nad

ROPHYLACTIC control of pregnancy tovermas in the List dangerous trumester ha proved a very complex problem. No treatment can be adequate however ingenious if it fails to eradicate their cause. Etto logical exploration to date seems to have progressed along four main approviches (1) endo cruses (2) placental tovins (3) kidney factors (4) chemical or organic poisons from other sources. Prophylaisi has not waited however for a comispleted knowled e of etiology, and many workers have stressed the value of vitamins and better 5 food in preventing tovernias or alleviating their symbtoms.

In 1910 Mitchell made the observation on empirical grounds that an imadequate complement of calcium was a predisposing cause to the toremas of pregnancy. Morel and Rathery found that a los ered detortiying function of the liver followed parathyroidectomy and the resultant de angement of calcium metabol sm. The liver of course is one of the principal sites of attack in clampsia, and other late tovermas of pregnancy

Lopez found in his tovemus senses that prompt improvement followed injections of Collip's para throat extract with diuresis and a dec ease in blood pressure edema and subjective symptoms ensuing. In none of these was there any significant consideration transfer in the blood calcumited.

Richardson reported complete symptomat c recovery of two pre-eclamptics ho were given para hormone intramuscula ly and calcium and wosterol by mouth. Blood pressures of 150 and 160 respectively dropped to no mal level and even a two plus album nuria disappeared rapidly.

Daly claumed similar dramatic results with the oral use of tablets containing a calcium salt combined in the intravenous administration of a corresponding preparation. He made the interesting additional observation that only 11 peent of his treated series vere delive e1 prema durft, as aga ant 63 per cc. to fine c nt ols

J C Brougher reported a series of 88 to emic patients occurring notated of 1000 preg necessor of 50 100 a d up with arying degrees of ankle etem album nur a and definite to emic ymptoms. The

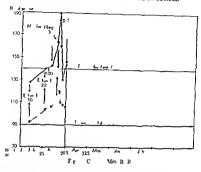
remaining 54 had pressures from 140 to 150 onlyslight ankle edema and traces of albumin—another tous symptons. Parathormone in r cubic centimeter doses was used to elevate the serum calcium. In each case duiresis occurred with prompt loss of edema general weight loss lower ing of blood pressure and a recession of to ic symptoms.

Theobald treated 50 healthy women less than 6 months pregnant with daily does of 20 grains of calcium lactate as well as 11 500 niternational units of vitamin D Only 7 of these developed hypertens on as against 17 in a group of 50 cont ols

Similarly Mendenhall and Drake found in a group of 188 vomen given calcium orally that tovems developed only twice (1 per ent). In a group of 230 controls fully 30 be ame toxic (1, per cent).

It has been shown (Albright and as ociates) that though parathormone increases phosphate excretion and mobilizes calcium it does not aid in calcium absorption. Conversely, thip, drotachy sterol (A T i ) plays an acti o role in increasing calcium absorption from the gastro intestinal tract atthough it is less effective than parathor mone in promoting phosphate exerction.

The great majorit of the first or high est ogen go up of toreine women respond to itam n E prophylas a sati factorily throughout pregnancy (i) A ertain sm il percentage of them however either do of respond perfectly at any time to such treatment or seem to escape fo om such



control at the end. It vas for the management of this refunctors a d diffi ult group that the treat ment outlined in this paper, the use of calcium and dihydrotach sterol, was thought of by one of u (WBS)

#### DATE

There were a patients in the g oup studed of hom 38 were of the h<sub>0</sub> bestroe in type and 4 of it elon estro en or true; e eclampite group Each of these patients 1 as g en orally a da h dose of 20 to 30 grains of c leaum gh onate or cale um dipl sphate which in the to enable in the case of the control of the calcium of hidrolachysterol was g en by mouth the same time in the form of his takerol (Winth op). In the calic calcium the discussion of this calcium the form of the takerol (Winth op). In the calic calcium the same time in the form of the takerol (Winth op). In the calic calcium the same time in the form of the takerol (Winth op). In the calic calcium the same time in the form of the takerol (Winth op). In the calic calcium the same time in the form of the takerol (Winth op). In the calic calcium the same time in the form of the takerol (Winth op).

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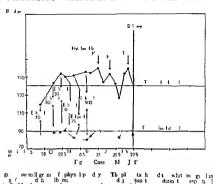
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#### SUMMARY OF RESULTS

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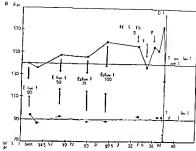
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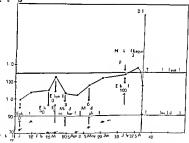
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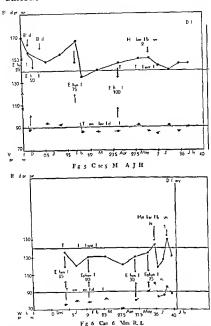
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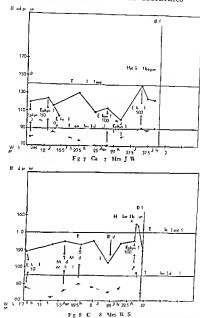
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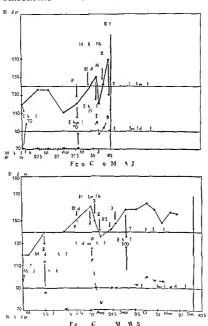


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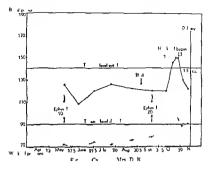
phyn iperd y By My 6h pess reh dn despt 75 mill gram i phyn i pe d y H d a d th edem T I d y I t 46/96 Aguts hhpss 1 boy 8 h IS gh g 8 po nd es ' born 35 5 / 00 \* 1 944 m th ry 6 945 54/ Sh 6 Mrs R L ged 33 y 94 1 Sept mbe blood p bom na Sh as thencef the gent dub nt flytak lpe dyns llas gr f gloot A ecklth pes h dfall Sh has bee Il thrwse hadh lastm tru Sept mbe 3 94 t ly h h d h d bot Wh 1 um Wb n t u pregn cy th t first see Dec mbe 6 po ta eo or h blood pes as as O J oth pes ose dd lyt 5/06 th m m lleg ed m b th n was l f lei lb mun n Th dose I hytak lw d bled 18/6 h h h d ed bth f lei m un as l compelled t ea pessary f ts p | pec A h blood est g as p h as g | ligra bled I cel th pes re and t 3 /88 Sh

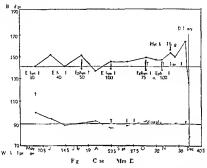




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#### DISCU SION

In this group of 42 refractory to vermia p t ents studed over the past 2 years 6 or 38 pe cent howed definite beneft on comb ned citle in and dhildrotachysterol administration 14 per cent showed a sight or transent benefit and 48 per cent were unimp oved. The imp o ement vas most evident in blood pressure but even a decrease of albuminum and edema occasionally was

In the earlier cases of the series dihydrotach sterol was given with extreme caution in an attempt to achieve the optimum level of blood calcium without ele ating it dangerously. When mail does were thus used the improvement obtained was neither as immediate or decisive as in later patients of the group who were treated with larger amounts. In no instance even when our highest doesage was employed namely 5 cubic centimeters per day did unto ard symptoms develop. The maximum quantity of the synthetic bormone used was it should be noted considerably below that recommended for replacement therapy in the hypoparathy roll state. No cumu lative effects were observed.

The advantages of the u e of dihydrotachy sterol in the pregnant woman are manifest. Its ability to increase the absorption and utilization of evoernous cale um spares the already menaced endogenous supply available in the bones and teeth. Hence it provides in these critical cases a much safer and more phy siologic mode of therapy than the use of parathormone.

Alost observers employing calcium or para thormone or both in pregnant women have remarked on the aston shing a formit of blood calcium. In earth of the aston shing a formit of blood calcium. In earth of the words of the hormone it would appear that in normal and near normal individuals so stabil zed is the equilibrium between conjugated and ion zed is the equilibrium between conjugated and ion zed

calcium that to produce an elevation in blood calcium an exceptional dosage is required. More over as Klatskin points out any excess of calcium or of phosphorus absorbed is excreted so rapidly that transitory variations in blood calcium level are rapidly leveled off Reed states categorically that there need be little apprehension for exam ple about administering amounts of parath r mone up to 150 000 international units for in definite periods of time

How then does dihydrotachysterol combined with calcium affect the tovernias of late preg nancy? From the aforementioned finds gs it ap pears that it leaves true pre-eclamptics clinically unchan ed and benefits only some tovernic pa tients of the high estrogen group. Most women in this latter group respond fai ly satisfactorily to the action of vitamin E as ve have shown else where(15) But d hydrotachysterol is of great value in that important small fraction of the high estrogen late to emias incompletely controlled in this manner by means of vitamin E

No attempt is made at this time to explain the underlying mechanism of combined dihy drotachy sterol and calcium therapy in the totemias

Its principle impact seems to be di ected mainly upon the pressor factor At least this t eatment should be safer than parathormone in co t olli the calcium factor in late pregnancy to emias

#### SUMMARY

The effect of comb ned dihydrotachyste ol and calcium therapy is demonstrated on a se es

of 42 toxemias This therapy d d n t improve 4 true pre eclamptics but defin tely helped 4 pe cent of 38 late toxemi s f the high estro en type i hich had

not been c ntrolled by vitam n E

3 This d fferent al respon e lends further support to our previous classification of the late tovem as

4 This therapy appears to be most effect ve in lowering blood pressure and le s in the co trol of edema and albuminuma

5 Variations in blood calcium le el were small in this series but the dose of dihydrotachysterol used was never more than 5 cubic cent meters pe day

6 This dosage is considerably below the le el of replacement therapy in hypoparathy od m and produced no toxic effects

The u e of dihydrotachyste 1 wo ld appear to be a more physiolo ic nd he e safer method of increasing calcium utilizat ni to emic women than the administ ation of pa thormone

8 No explanation of the mode of action of this treatment soffered

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A F Sul TCH H W and BLOOMBER
     E J Chn I est 939 8 55

HE J C Am J Ob t 94 43

A J Obst Gyn B t h Emp
                                                                                          933 4
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# EARLY RISING FOLLOWING MAJOR SURGICAL OPERATIONS

PAUL W SCHAFER MD a d LESTER R DRAGSTEDT MD Che III

ARLY rising of patients after major operative procedures has since the en thu astic report of its first advocate in 1899 (4) attracted the attention of many surgeons A recent review by Newburger adequately summarizes their observations Inter estin I enough those who have given this princi ple an exten ive trial have almost uniformly been fa orably impressed and many have loudly ac claimed its virtues. In general critics of the practice have left admittedly had little experience with it and have based their criticism on one or a fev unfortunate complications which may or may not have been justifiably attributed to early ris ing In spite of the fact that the medical litera ture mainly European contains reports of many thousand of favorable cases to only in the past few years that any sig I ficant amount of attention has ben given the subjet in the country. This seeming paradox exists because ealy r sing of patients after operat on is the ex ct contradiction of one of the most deeply rooted principles of patient care Early rising of patients with early and rapidly increasi g ambulat on together with coughing and breathing routines is not here being advocated as a substitute for but as an adjunct to the generally accepted and proven features of surgic I technique and preoperative and post operative care Indeed early rising is now possi ble only because of improvement n surgical technique with gentle handling of tissues ac curate reconstruction of would strict asepsis and adequate ge eral and local pre antisepsi operative preparat on good anesthesia p ophy lactic and definitive dec ripres ion of the stomach and intestines re toration and maintenance of fluid balance and recogn tion of tl e importance of blood and pla ma loss which must be replaced by adequate transfusion. Undoubtedly in the past attenpts at early rising and ambulat on of pa tients occa ionally met with f il re because the care of the patient was other vie i d quate

It vas with considerable hesitati n that we began to test the principle on p tients who had had ome of the larger u g cal procedures

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Soon after this favorable experience more and more patients were subjected to the same routine. Since enthusiasm mounted within months all patients on the service were out of bed on the econd postoperatile day. The 102 cases summanized in Table 1 represent the basis for this report.

As may be seen in Table I the series includes most of the usual general surgical operations. It is made up of patients who without selection presented themselves for surgical care from February to September 1944. Since October 1 944 many more patients have e pe ienced early rising but a e not included in the scommunication. The general manageme to of these patients and

0.1

TABLE I -SUMMERS OF LOSTOPERATIVE OBSERVATIONS ON PATIENTS EXPERIENCING
FARLY RISING FROM FEBRUARY TO SEPTEMBER 1014

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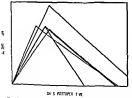
specife su gical te I inques were in no way alte ed with the institution of this program. And meas were operated on through a valety of incision must oblique and transverse approaches bein most to innoisy used. All per torsels situ es were of a continuous type usually a double strand of either No oo or No o ch omic gut being used. Clos reo of the facia valually and with the continuous suture of either No oo or No o chromic gut re-inforced with interrupted satu es of No o chromic gut placed z to 3 cent met is part. Interrupted No eco plain gut sutures

reu ed for the subcutaneous fat and c tt ou black silk f r the skin A grd ron cisson vas routinely used for appendectomy H m epair followed the ge eral patte j stind cat d No abd m nal poot wa ruti ely used although n cases which we elikely t equire frequirt dress g an adhes e type corset was employed Ea ly ris g w s begun at some time during the first o second postoperative day and rapidly inc c sed the eafter

It stifficult to con es the extremels ha orable impression which has been made on s by the aducal depa to form a firmly enterched routine of po topectate care. This of ficulty less chiefly in the first that the benefits which results as of a nature with chief on the asy lend the set to conversion atto letters numbers of mab is hot may be charted or made into

g phs dag ner it de cription san i adequate sub titut for th p e e f observing these pat ints. They pose a e cellent morale which mp es d y by day as they effeed from the hud a f app he sin fear a dimagned com pleat s h challes p t to beset a person no familiar with the ways of medical practice. Be cause of early exercise the marked weakness felt by the patient who leaves his bed on the tenth or twelfth postoperative day is greatly minimized Early 11 ing allows the patient to take over the management of his own personal hygiene at an early period and thus greatly reduces his nursing requirements. In this series patients have not been discharged from the hospital as early as their condition would have permitted since an op portunity to observe them clo ely vas desired However their hospital stay can be materially shortened as a result of early rising. This repre sent a financial saving to the nationt and because of the more rapid turnover allows hospital care for a larger number of patients with existing hospital facilities

Probably the most important result of early rising 1 the prevention of many minor and major pathological pulmonary changes Following op erations within the abdomen especially pro cedures in the upper abdomen and as a result of maintenance of the horizontal position the dia phragm is reflexly inhibited and assumes an ab normally high position. This factor results in basal pulmonary atelectasis with all of its haz ardous potentialities Cl nically this condition is evidenced by shallow rapid respirations in creased pulse rate basal suppression of breath sounds duliness and rales. These changes ha e been observed so constantly in the fi st few post operative days that they have become accepted as the normal postoperative course and all surgeons are familiar with the postoperative humo in the TPR curve Leithauser has



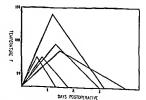
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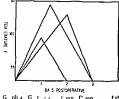
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shown that with early rising the vital capacity returns to normal in half the time required by the bed confined postoperative patient (1)

In this study the problem was approached by a comparison of the postoperative temperature records of early rising patients with those of bed confined patients. Forty early rising patients records were compared with those of one hundred bed confined patient cared for by the four other general surgical services of the clinics. The results may be seen in the accompanying graphs (Figs 1 through 5). In practically every instance, the early rising patients had a lower maximum temperature elevation and resumed a normal temperature level sooner than did the bed con fined patients. Clinically this freedom from profined for the patients.



Graph 3 I gw I b en 1 my C mp nso f th rag po 1 pet t mperat re d f gr p f ly g p i t this e f th bede f he dp t t f th g l gr i se es Th sold bl k i losg th haded re f th g ph peset th rag postoperat t perat cod f th ly

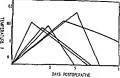


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ment in the character of respiration. Others ha e claimed for this routine a lessened incidence of thrombophlebitis phlebothrombosis and embo lism (2) but since these complications a e relative ly rare in this area no valid info mat on can be obtained from this series in which none of these complications v as observed It may be that early rs gwould epre ent an adjunct to or possibly a substitute for vein I gation which is practiced in the Atlantic and Gulf seaboard states in which localit es these complications are common

Almost the only consistent criticism of early r s ng is tlat it m ht mechanically dama wound and sult in delayed healing post operative herniat on or deh see ce From ob servations made on these 3 patients there 1 no bas fo such criticism. In the entire series o ly four sign ficant complications have been en countered Two we ef tal t es and two were late hern at one and in no case is the e good evidence th t the s me complications would not have c curred fearly rising h dn t been rried out No s gn ficant pulmonary completation occur d in ny one of the 103 cases

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#### SUMMIRY

In summary the early ring of og general surgical patients has been ob erved and has re sulted in a uniformly favorable impression of the practice Improvement in the general well being of these patients over that of bed confined pa tients has been discussed. With early rising there is improved morale avoidance of asthema more patient self care and less nu sing care less finan cual loss to the patient because of shorter hospital ization and earlier rehabilitation and because of more rapid turnover more patients can be cared for with exiting hospital facilities and personnel Early rising patients have been shown to have a lower postoperative fever of shorter duration than the bed confined patients of four other general surgical services This factor in our opinion is clo ely related to observed improvement in respiration The record of complications presented here compares favorably with the number of complications observed in a similar group of bed confined patients

#### REFERENCES

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## **EDITORIALS**

## SURGERY Gynecology and Obstetrics

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JULY 1945

#### 1905-1945

HIS issue marks the beginning of the forty, first year of Surector Gyne Coloo? And Distretice Sounded in 1995 by Franklin H Martin It was his conviction that there was a real need for a surgious to be edited by active surgeons to be edited by active surgeons the profits from which should appeal to practical surgeons from which should be utilized in strengthening its worth and influence

He was aided by a small group of young sur geons who had been intimately associated with him in the course of their surgical training by Mr T E Donnelley of R R Donnelley & Sons Company a friend of long standing and a nucleus of men and women who have loyally and conscientiously carned out the many sided tasks of great ma intude which are so vital to the success of such a public him yenture. The unfailing interest and enthusiasm of this original group who be lieved in Dr. Martin's dream and their stead fast devotion to the ideal of creatin, a su gical fournal second to none which was firm within

the heart of each of them are re ponsible for the success of SURGERY GYNEGOROUS ON OBSTERIES. The direction of its business affairs the assembling and composition of the material presented the quality of its type raphy and reproductions the conduct of the daily affairs of this journal have all represented throughout these years the contributions of the personalities cho en to carry out these many activities. It has been their gifts throughout the years which have made of the journal more than an ordinary commercial enterprise.

The editorial policy from the first vas cre ated and carried out by Allen B kanavel whose idea it was that the journal should con stitute a forum wherein the ideas and accom plishments of men in the surgical world could be presented without any imposition whate ve of the belief or opinions of the editors The sournal souched for the honesty and sincents of the authors whose work it published but left for its readers and time to e table h the cor rectness of their views. All editorial comment and book review have always been publife? over the signature of the author upon the basic principle that the reader has a ri ht to know the source and may assume that what he read is a well considered statement of notation

With Mrs. Martin s death the direction of Surgers Gynreology and Destricts passed into the hands of the Board of Regat of the American College of Surgeon another of her husband's contributions to the surreal progres of this count y The journal will continue to attempt the fulfillment of Dr Martin's conception of a surgical journal and will do tot its parse to the contributions of prac

tical surgeons edited by active surgeons with any and all profits derived from its circulation and advertising matter utilized for the creation of an increasingly better production

LOVAL DAVIS

### SUBDURAL HEMATOMA

UBDURAL hematoma was once con sidered a rare condition and of only pathologic interest. Actually it is one of the important indications for surgical intervention after craniccerebral trauma. Virchow originated the concept that subdural homor rhage was secondary to some inflammatory process of the dura and gave it the name nachymenicus interna chronica. Numer

ous reports have presented various etiologic causes notably lues alcoholi m curvy and infectious diseases. It was not until Trotter's report in 1914 that the condition became of interest to surgeons

Contrary to the concept that inflammation is the primary ethologic factor is the concept that the primary le ion is a hemorrhage. The hemorrhage is not necessarily traumatic Russel and Cairns reported four cases of car cinomatosis and sacromatosis of the dura with formation of a subdural false membrane. Neoplasm or vascular malformation may be a predisposing factor. The writer has had a case of subdural hematoma overlying a gho blastoma of the temporal lobe and another overlying a venous angioma in the same loca uni. Both of these patients had suffered a mild head injury before the onset of any symptoms referable to an intracranal kisson.

In essential question is the primary location of the bleeding—whether subdural or intradural Baker Hannah Kaump and Love have presented histologic evidence to indicate the intradural origin of these hemorials on the other hand Leary pointed out that in the early tages of encapsulation of

free blood in the subdural space the neomem brane or capsule forms first on the dural side and later on the arachnoid side and that the neomembrane on the dural side is always in a more advanced stage of development than on the arachnoid side. Surgical observations on subdural hematomas in various stages of de velopment substantiate. Leary's statements

The mechanism of the progressive enlarge ment of the clot is a matter of considerable dispute. All are agreed that there is progres son in the development of the clot. Massive acute subdural hemorrhage does occur in extensive njury (accration) of the brain. These cases have early and marked symptoms and usually result fatally. The onset of the subducte or chronic case is slower and often in sidnoss. The initial brain injury is relatively insignificant or if more evere the patient recovers from it.

Gardner Leary Munro and others have assumed that the initial lesion is the escape of blood into the subdural pace. As the result of a fall or a blow to the head the brain is dis placed in the cranial cavity. This may cause tearing of a vein crossing the subdural space Recently this has been demonstrated experi mentally in the monkey by Craig Sheldon and Pudenz who have been able to take mo tion pictures through a lucite calvarium of such a hemorrhage following a subconcussive blow to the animal's head Usually it is a superior cerebral vein that is torn but inferior veins to the sphenoparietal or transverse si nuses may be torn In any case runture of a vein as it cros es the subdural space allows the escape of blood into that space. The venous pressure in the cerebral veins is low and the bleeding usually soon stops spontaneously A liquefaction of the blood in the subdural space begins the resultant fluid is high in protem content Since it is separated from the sub arachnoid space by only the arachnoid (and

later the newly developing neomembrane on the arachnoid side) and since this is impervious to the large protein molecules in the liquelying blood an osmotic imbalance mu t exist be tween the cerebrospinal fluid and the lique fying blood with resultant passage of fluid into the subdural pace. As time goes on and the hemoglobin molecules begin to break down there is a great secondary increase in molecular concentration following the break ing down of the large protein molecules Con sequently there is a late secondary tendency to increase in size of the clot. The dura reacts early to the presence of the blood in the subdural space and a neomembrane or capsule forms first on the dural side Later a more gradual reaction of the arachnoid produces a neomembrane on the arachnoid side of the

Most subdural hematomas are on the late cal aspect of the hemasphere ome are interested and inferior and anterior others posterior and inferior. They are pro-ressive expanding lesion and must be treated surgically. A burr hole in the parietal region above the car will disclose practically every clot. Most of them can be satisfactorily evacuated through single or occasionally multiple burr holes only rarely is it neces ary to riflect an osteoplastic flap. Since the clots are often (12 to 15°6) bilateral a burr hole should be made on each side in every case.

In 75 con ecutive patients who were oper ated on a history of trauma was present m all but three At times the trauma is so sh hi that it i one looked by the patient particularly if a con iderable time interval intervenes between the trauma and the appearance of the symptoms. This interval may be ref or it may range up to several months. Time intervals of a year or more raile the question of a second later, but forgotten industry.

Mental disturbance is the most outstanding clinical symptom and was noted in over to per cent of the cases The picture i usually one of progressive confusion finally advance to stupor or coma Very often the condition fluctuates markedly. One day the patient is grossly confused or stuporous the next rela tively alert. Occasional dramatic recoveries from apparently terminal come may be stim ulated by administration of a hypertonic solu tion of glucose or sucro e intravenously or by spinal drainage. Unfortunately if the true condition is not recognized the physician i lulled into security but soon the patient lapse into a stupor that is permanent and end fatally

Neurologic abnormalities in the form of hemiparesis or paraly is abnormal reflexes or some de<sub>o</sub>ree of aphasia are very frequent These findings often do not appear until lite in the development of the condition. Head ache dizziness or nausea and vomatin are common.

The spinal fluid 1 vanthochromic in two third of the cases. Clear spinal fluid de n'rule out the pre ence of a hematoma or even make it improbable but vanti ochromic flui usually indicates the dia no! However substanchnoid hemorrhage is often present in brain injury and if the antecedent trains brain injury and if the antecedent trains weeks the vanthochromia has to be die garded. Observation of the pinal fluid find in in a large number of cases of training substanchnoid hemorrhage has convinced us that the spinal fluid will be clear within 12 to it days after a brain injure.

Papilledema is found in one half of the cases. Convul roos often Jack onnas some time generalized are seen neally a often as in tumors near the entral sulcu. Occasional brady cardia with a pulse rate below 60 i present in many case. It is seldom persistent

only recurrent and often is noted only by reviewing the hospital chart over a period of several days

Subdural hematoma during the past thirty years has come to be recognized as an important post traumatic surgical complication Vany cases are still unrecognized. The surgical profession should be more aware of three condition and realize that often it can be recognized only by the exploratory burr hole. In any su pected case bilateral posterior parietal burr holes should be made. If no clot is found little harm will be done by this procedure which entails minimal operative shock and can eastly be done under local anesthesia supplemented by intravenous anesthesia if the necessity arises for such a procedure. Hydol C Voris

## THE SURGEON'S LIBRARY

#### REVIEWS OF NEW BOOKS

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W TER CARR L

## AMERICAN COLLEGE OF SURGEONS

# THE BASIC MEDICAL SCIENCES IN GRADUATE TRAINING IN SURGERY

CEORGE H MILLER MD Ch g lil

ROGRESSIVELY increasing attention was being given to the subject of the base of medical sciences in graduale training in Surgery prior to the outbreak of war. Since that time the pressure of wars demands on all facilities for medical education and the disruption of graduate training programs have temporarily forced it into the background. Now with it eapproaching prospect of peace it is ag in assuming a postion of prominence. It is impossible to become even general due to the difficulty of producing the control of the sufficient additional graduate training facilities to meet the needs of medical officers some of whom are even now beginning to be re-

leased f om military service

The s ze of the postwar need has been dealt with
in published analyses of the ansers to question
naires sent to medical office s in the military
force by The Committee on Postwar Medical

Servi e (2)

Reports have also been made dealing with the p ssibil t es of increasing the facilities for gradu te train n ( 3) The need can be met only in part by increases in the number of residents 1 hos pital now qualified frg duate tran g It wil require in addition the development f train g p grams n a considerable number of hospit is which nither it has not been doin gad ate tra ning Assistance 1 this expans on is to b e pected though the utilization of sime of the large p 1 ate h spit is selected city a d unity ho pitals and certain ho pital of the Unit d St tes G ve nment services Co operat e programs are al o be g de loped in which part f th vok sobtained in the graduate tan g de partme tofam d l ch ol ndp tmahoptl not und medical school cont of

In o s de n the est bishme t of dences in a hosp tail which h s n th dagradu t t am ng pr g am e of th p bi m which com s t the fore and oft n is difficult of lution the assurance of dequ tet a ning n th b sic med cal science Th phas i triight e ed m creasing mphass in een t years both by the

American College of Surgeons and by the Sp culty Boards. The ad ances in medicine and surger have made the semphas sumperative It is rather force that the officers of a hosp tall cutten plating the establishment of res dene want know what constitute adequate basic see to training.

It is also important for the train e in a pecialty

to have this information available. In "will be en more it e after the war whe there if thes la ge in mber of interrupted po must be completed. Although hospital ge eally re row to con plete the train in of their interest each et swho are now in military serve the laget the war lasts the mo impossible the bear the server in the training possible to the complete his certain in the thee will be many, and doctor who will find it necessay to complete his neglection of the server in the most plant in which he was a eside twhen the whospital in which he was a eside twhen the wongst in introduced in the server in the

At the p exect time one has a complaint that is of fincult for the education must tee of a bit of pall to find any printed statement suffer not clear a detailed the sene as a given formulation plans for basic science than the me bold true for a tain what is to be sure the adeq acy of a program when he is making

cho ce of a hosp tal res d n v

It ha cem'd dest ble to undertale a discussion fith phase of training in order to train at the conditions of the conditi

It sh ll b the purp e stead t emphas d br int perspect the maj r bject es nd t co s d some of th means f attat ng

them 106 PRELIMINARY SURVEYS

It is a matter of common knowledge that there is considerable variation in the programs of graduate training in surgery in different institutions which are doing excellent work in this field

In order to make an effective approach to a consideration of the place of the basic sciences in the programs it seemed desirable to visit a number of representative institutions. These vi its were used to some e tent for the obtaining of statistical data regarding differences in the programbut still more through unterviews vith members of the staff who are responsible for different phases of the training they were used to gain an idea of the developmental background behind the differences. The interviews also offered opportunity for a frank discussion of the e-periences in each institut on as to points of special strength or weakness and the present trend of their effects to improve the program.

The visits while concerned cheft with the larger medical schools have not been c nfined entirel to the e but ha e sampled as well the eper ences of certain smaller school and non teaching hospitals which have been offering approved residences. They have also been made to include a limited number of hospitals which have not been doing graduate training but are now preparing to begin it. The latter have been included in order to gain a firsthand k owle lige of the special problems fa ed by such ho pitals in undertaking its work.

Coomania III 4 HO K

Geographically the contacts ha e covered the country widely in orde to include any significant regional variations and trends

The following discus ion has gro nout of interviews with members of the staff of thity four medical schools and of twenty five no teaching ho nitals

HISTORICAL

It is wo the hile to note briefly the sequence of developments leading up to the present position of the basic sciences in graduate training in surgery

The training of pecial sts in the field of surgery has shown a steadily increasing empha i on the base sciences of era considerable period of years Fifty years ago the young doctor serving as an apprentice or holding in assistantish p in a department of surgery yas concerned the fly with developing the best possible skill i operate go Othe exaggerited promitione was given to such considerations as speed in oper ting and the abilition period through extremely small in sons it altons attention was given to de its gipse call suttree methods and to various tick. Aux of time likely the properties of the

During this period the more energetic and progressive men holding assistantships in the better university departments of surgery were likely to seek opportunity to serve in the department of anatomy as demonstrators to the undergraduate medical classes Some became excellent teachers of anatomy and were a source of stimulation to students by introducing examples of the practical application of the study to their clinical work The work in anatomy has been retained by many institutions as a part of the graduate training pro g am though not most trainees assist in the course in surgical anatomy instead of in general anatomy The point to be emphasized is that at that time v ork in anatomy constituted usually the only specific emphasis on basic science during the training of the surgeon

About the turn of the century, there developed an emphasis on the value of a study of pathology, by the surgeon in training. This was the result of the wider appreciation by surgeons of the fact that successful surgery is dependent not only on a knowledge of the anatomical accessibility of the lesson and on good technique but also on a full knowledge of the life hit ory of the disease process. Whether in the realm of inflammation or of neoplasm or of other surgical conditions the surgeon wanted to think beyond the immediat anatomical lesson and understand fully, its near and

remote effects and sequelae

For a time in the field of training pathology was regarded more or less as an interloper and a competitor of anatomy. One heard at times heated discussions as to which of the ti o sil ulid be chosen by the prospective surgion as his tidd of basic cience vork. After a relatively fee years these arguments practically disappeared The ambitiou trainies vere adding pathology and retaining anatomy by giving a redu ed amount of time to the dissecting room.

Some profes ors of anatomy resisted at first the reduction of the demonstrator s time but before long both pathology and anatomy, we sharing in the base science attention in most good programs of surgical training. A limited attention to bacteriology was sometimes included with pathology.

More recently with the extended use of surge v in the reconstruct e field where ph siolo ical cons derations are prominent and with the devel opinient of corrective surgery in certain abort rmal plvs ological states phy iology and bloochemi tri lave been brow ht prom nearly into the training picture. As no developments in the feld of anestless requiring discriminating those and foreknowledge of potential complicate os is the improved handly gof hock and of preoperative and in proved handly gof hock and of preoperative and in the province of the provinc

postoperative manageme t together with all the new advances in the control of infection have brought pl vsiology bochemistry bacteriology, and pharmacology all into a position of increased interest for the surgeon. One might even add parasitology to the lit to not of deference to tho e surgeons v ho are dealing constantly with such conditions as hydatid exist amebia abaces and elephantiasis. Thus it is evident that surgers has go n steadily into a closer relationship vith practically the whole field of the basic med cal sciences.

THE OBJECTIVES

In seeking an answer for the question of the hospital committee or of the trainee referred to abo e it is necessary to visuable as clearly as possible the objectives toward which the basic ence work of a gr duate train gr pog am in surgery is directed. These objectives may be valuously expressed and must be permitted a cer tain variation of emph asis in different institutions and under varying conditions.

Howe er the broad ge eral objects e of g adu ate training in these specalities s to p o ide for the country the highest level of surg cat ca e by furnishing under competent instruction and su pervis on the best possible training in both surgi

cal skill and surg cal judgme t

A other of jective i the de elopment in the futu e specialist of a scient fic inte est and back ground which vill make him capable of i sing such opportuities as may be present in his work fo contributing to the advancement of medical

sc ence The emphasis on the basic nedical icences in the tra n ng pro ram while di ected toward th broad objective fe d to bears most heavily o that whi hi reg rded by many as the more im po tant and more difficult phase of t aiming-the development of surgical judgm at. For this it must be appl d b sic s ence It s applied in m ny ways but especially in the cientific study d n the cou in of a clea under standing of the fundamental interp etations f cluteal ph nom n n the special field De loped in the way the basic sce ces a m ed from ew w k nd should be f real the status of g duate caliber They also tak on new inte st by eveal ng a threefold goal—thorough t un ng mprov d care of p ti nt nd ontrbut n to sc ence

Some unfo tunate m sconcept on bave a n from fail e to d the appl ed b sic sc ence as adv need work at g aduate study level Fol lowing a e the miscone pti ns most comm nly 1 Review courses are needed becaus the resident has forgotten details of his unde gr hat course

The basic science equipment is of the College and of the Specialty Boards are academic hindles which require special basic sciencest dy to dear but are of no fither concern

3 Lectures by a preclimical teach r can to er fail re of the 1 mical staff to make adequate application of basic serie ces.

4 Bas c science requirement can be met b giving the reside t training in the tech que of the diag out c labo atory of the hosp tal

Let us cons der in turn each of these mi

1 \eel fo re seu courses Certainly the reu dent vill have for otten details of his under graduate work and review tudy is necessify This however is not done best formal e excourses He should be obli ed to e new in o der to meet the dem nd of the ad a ced w kofh; tranng pog am Such dema damay ons tm ass ned p ticipation in vell o anized s minst programs a d clinical conferences a dishild be e ident also ir ward rounds a d in cli are kept tahih in tructo lle el The latter is illu t ted by the answe of a es dent he asked abo tattent on to a atomy H sa 1 We don thate any new cu seb t Th Chief gi areal quiz natomy as a patofh di u and que t ming at each ope tion a d we s re ie vall the t m to keep up w th him ha e to

In see eral one may say that the dem ndf rrenew hould be inherent in the well o nized graduate t 1 is program but fo mal e c cou es of undergradu te work lould of c nsh

tute a p rt of the s hed le

2 Treat g basic scrences as 1 dls Th dis that the b sc scene a e hu dls s not e treb 1 erro C t inly as requ ements for quibnat 1 n they ssume th sch acte The error le in treating them s n thing mo e than h rdles he in real ty meet n thes equ emet t sho f lb

de ce fan est blished gu litt im pofess of sillust ted by the tenden; of some ca dhiste for qu fifcat on to g t the be lof a prediction of the prediction of

Likewise some hospital committees seem to have regarded the basic scien es as merely awk war I requirements which must be met

This regarding of the basic sciences as mere hurdles and the reliance on cramming for examinations should stead ly diminish as more and more emphasis is placed on the application of these sciences to the daily work of the clinical specialist

3 Use of undergraduate lectures The sugge tion is sometime made by the educational committee of a hospital that they will meet the basic science requirements for residents by having them attend the undergraduate lecture courses in a nearby medical school or sometimes by arranging for professors to give special short courses in those pre clinical subjects. To say that this is unsatisfac tory is no reflection on either the professor or on his underg aduate course

The difficulty is that such undergraduate lec tures are not applied basic science nor are they

graduate work

If a hospital is to use uni ersity courses to sup plement its training program in the appl ed basic scie ces such courses should be given by teachers prepared for this graduate wo'k and ha ing a knowledge of the clinical problems sufficient to permit them really to present the application of the basic sciences

4 Traiti gind agi stel borato 3 The ques tion of filling the basic science requi ements by assigning the res dent for a pe 10 l of training in the diagnostic laboratory can be ans ered b re call n the main objectives of the esident's train g program It is not reasonable to use his time for training as a laboratory tecl nicia edge of the mo e elaborate procedures of the labo ratory should be such as to emphas ze the r range of usefulness and also the r limitations in bis field It should thus enable bun to make mo e effective use of laboratory work in h s clinical lects ons

Exceptions will of course arise as n the case of a resident tho is engaging in a research prob lem dependent on certain clinical laborator, tests He will need thorough understanding of those procedu es and can usefully work in the ch ical laboratory as an inter al part of this spec al pro ram

The principle governing the relationship of a resi lent to the dia nostic labo ator; should he a recognition of the fact that he s there p marily n applying laborators find gs to pat ents and nly secondarly or n a research capacity to take part in the techni al work of the liborators

#### DIFFERENCES IN APPROVED TRAINING PROGRAM5

Differences in total length of training period The length of time which has been adopted by the Department of Graduate Training of the Ameri can College of Surgeons and that required by most of the Specialty Boards for surgery and the surgi cal specialties as the minimum for the institu tional phase of training is three years after an approved interneship. In the larger teaching hospital the length of residency varies all the way from three to eight years Approximately ball of those included in this study were found to have surgical training programs of five or more years duration while the other half have programs lasting either three or four years

At times in the past there has been some differ ence of opinion as to the relative ment of the sborter graduate training programs It should not be regarded as reopenin any old controversy to take the position at the present time that the new residencies to be developed 11 the effort to meet the postwar training load will fall for the most part in the second group and vill be of three or four years duration. For this reason, the follow ing comments should be regarded as referring especially to the facilities for and possibilities of this group

This is not overlooking the alue and the neces sits of training beyond the three or four year period The ultimate aim should be accomplished effectively with a wider recognition that the years immediately following completion of a three or four year program are a continuation of training t life holding a limited responsibility appoint ment

la att ttt conte t of the lan ng programs The institutions studied showed variation not only in length of training program but also in con Over many years the r accomplishment shows however that this considerable variation

f prog am 1 not inconsistent w th excellent re sults. In reality such fle ibility is desirable as permittin the best ut lization of the differing facilities of institutions both in material and in staff A certain flexibility should also be utilized in developing most effecti el the special scien tific aptitudes and interests of the trainee should be remembered however that the range of variation which may be appropriate in programs of six to eight years durat on is much reduced when one deals with a three or four year p ogram

T me de oted to tleb s c sciences Confus on has sometimes occurred because of two different inter pretations of this Some have discussed it as re ferring only to those pa ts of a residency during

I last

by hitheres dent is rele elfr m respo sibility for pat ents d devotes hin self solely to one or more of the bisic scienc. Otle regard it as including all these place through at the whole training where uplic to n of basi sciences is emphasi el The latter is a very imp rtant part of the pro ram. In fact, the permanent value of tle basic cience vork is lejendent to a large ext nt on the digree to which the clinical staff makes constant application of the basic sciences in its discus ions and v ork. This teaching however is incorporated so intimately ith the clinical training that it fail to appear in a time record Sem nar and teaching conf re ces are also an important me n of emphasizing certain of the appl ed basic ciences and these likewise do not appear in any listing of time devoted specifically to those sciences

The above distinction must be taken into account in the formulation of a graduate t ain g propram and adequate p it ion must be made for both phases of empl as on the basic sc ences

In some of the hop till which have residences of siv or more vears it is custom my to have as a giments till gas in chase gibee in theore two years do not applicable to lossibility to the bus escences and recarch. Ob ously such a pro-tam is not applicable to lossibility which devote only three of four years to the vibile residency. In the latter group of hospit is the time devoted entirely to the bus escences must be co-siderably sho ter Us ally twartes bettee is, a ditable months This sho ter amount of time ed ces correspond in ly the range of the bits in that part of the program

WI t base see es sho ld be melt d d! A n int oduction to a discussion of the basic seences to be included the following e ce pts are quoted from the published requirement of the different board f sug y and the sign elsepte alties a dot the American C llege of Singeons.

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receiving a parite time allotment must not be regarded as la king in importanc

The most common special assignments of time for the basic sciences are to patholo; and

aratoms

Path log1 Since many of the surgeon's deci sion depend closely on his personal kn > ledge of pathology the subject becomes the one most urgently requiring an individual assignment of the resident's time. There is practically unanimous agreement on this The ho pitals with long train ing programs in many cases allot a whole year to nathology while those with shorter residencies commo ly reserve six months primarily for this work

In addition to this period of concentrated atter t on to pathology it is of course es ential that the res dent throughout his whole training hould con tinue to study the pathological material f om his service. In a surgical service which has its o'n department of surgical pathology this is easy others the necessary daily or frequent contacts with the department of pathology must be main tained A few surgeons have voiced the bel ef that the latter type of study of pathology can be made sufficiently thorough alone to serve for the resident's training in the subject. Most however think that this type of di ided responsibility can not produce as good a result as when combined with a period of full time service in the depart ment of patholo v Another advantage in the assignment to pathology lies in the oppo tunity during this time of carrying on or of collaborating in a research problem in this field. The experience in exhaustive reading in the field of his research problem and the need for discriminating e alua t on of the work of different contributo > to its l terature are an invaluable element of this part f his training

Inatomy Often a special as gament f time is made also for the study of anatomy This is true in about half of the programs surveyed. Two ur geons placed a atomy as more important even than pathology in the study program. Howe er this v as more than offset by the opinions of many profe sors of surgery who think the time can be better utilized if careful attention is given to pointing out anatomical considerations a d to quiz ing p or to and during operations and in the autopsy room thus alloying studies on the ca daver to be reduced to a relaticely small number of special regi nal dissections

While a separate allotment of time for work in a department of anatomy is desirable and is pos il le in the longer training programs it would eem that the necessary emplass on this subject

can be otherwise provided in a well organized training program. In this case however it must be d fintely included as a teaching responsibility of the urgical department

Bacteriology pivsiolo v bioclemist v and phar macology Applied bacteriology will usually be included to some extent during the period devoted to pathology In general however all of the above group of subjects are applied so continuously in the daily work of the resident and are such an essential part of the study and treatment of his patients that the clinical work of the hospital becomes the place where the advanced study of these subjects must be centered. Every ward round and conference must stress one or several o all of the e according to the variety of the cases presented They hould also be given special and detailed application in seminars planned for that particular purpose

The use of specialists from preclinical depart ments and from other clinical departments v ho are qualified for this teaching is a necessary part of the program but they should be regarded as consulting specialists and contributors and not used as a means of relievin the clinical staff of their continuous responsibility. The residents research work also whether clinical or preclinical in origin will require advanced study in one or more of the bas c sciences

The important broad consideration here is that the application of these ciences to the study of disease in patients should be real graduate work for which the clinical departments must carry a

large share of responsibility

Use I teach 1g assignn ents in precl nical depart ments In the longer residencies an assignment to assi t in a preclinical department can sometimes be used to advantage since the liberal time avail able allows the resident to engage in research and advanced study as well as to as 1st in feaching In the shorter residencies the brief time available for such as ignment is I kely to be entirely occu pied by a heavy routine teachin program This creates a danger that the resident may become only a borrowed teaching assistant instead of a member of the graduate training group of that department Preclinical teachin, ssignments should be used only when the training value for the resident obviously compensates for the time allotted to the department

Rese rch The value of research as a means of stimulating study in the applied basic sciences should be utilized in the graduate training program Only the longer programs can allot a large segment of time for example to the bacteriologs laborators for a study of infections or to some other laboratory for experimental work in that field. Accertheless it i possible and necessary e en in the shorter programs to stimulate an in quiring attitude of min l and to encourage and guide the resident in investigative wo k on some problem of past totals interest to him.

Co ope ali e pr g oms Some hospitals recog nizing their eakness for training in the base seie ces ha e corrected the defect by appointing to the staff men specially qualified for this work

Other ho pital which face a similar difficulty but are unable to apply the ame solution should seek to develop a co operative program with the hospital of a convenient methical school or with a graduate school of medicine which gi es a followarp or the provided graduate train gi opgram. The following illustrate diffe ent forms of co-operative effort already being used.

1 Å co operative pro ram is at a ged with the ho i ital of a med cal school under hich part of the residence is spent in each of the two hospitals. Three year programs divided on both 2 I and I ratios are being employed. To years I each hospital is a proposed impro eme t.

2 When a medical school is near at hand a program may be planned by which the residents can have access to certain of the applied bas of science facilities pro ided for the surgical re i

dents of the university hospital

3 Arrangement may be made for the resident to spend one year in the comb ed applied base of science and all iteal prigram of a grad are school fixed one with offers a fully proved g adute training pro-am

4 A a gement may be made fo selected members f tle staff to become tempo a ily ad juncts to the teaching staff of a uni ersity hospi tal to gain a broade sc entific background and a better fam harity with graduate t a nin method

5 A hospital may secure the assistant of guest teachers. This refers it to the usual series of ust in lecturers but as o e hospital phemploys at a tern day full time visit dimensions with the staff as well as in the cafe condesements for residents. Additional forms of co-operative effort will doubtlessly be devised a medical schools and hospital continue to well ad plan to ether for the best utilization of the comb ned resources for grad atter training.

The foregoin, di cussion has dealt with the bases extence req irements in a broad may a claim the light of the immediate postwar training needs it is n t dealt with strictly one-departm it quest o s such a sten need of ophthalmology to spec all courses in physics of optics and phis olor of optics nor of otol tyru olory as make need for a greater responsibility on the part of medical schools for graduate ed cation in the chineal field has been omitted.

It is hoped the tithe di cus n may be of as t

ce to ce tain hospital staff group who desir t undertake grad ate t aining to eval ate the r resources and to take the necessary steps t orga ize a stoo trining pogram

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# International Abstract of Surgery

Supplementary to

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## COLLECTIVE REVIEW

Cranioplasty JACK I WOOLF M D and A EARL WALKER M D FACS Chicago Illinois

SURGERY OF THE HEAD AND NECK

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## ABSTRACTS OF CURRENT LITERATURE

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# INTERNATIONAL ABSTRACT OF SURGERY

VOLUME 81

ULY 1945

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# CRANIOPLASTY

Collective Review

TACK I WOOLF M D and A EARL WALKER M D FACS Ch as Illin

## INTRODUCTION

THE interest of the ancient physicians in trepanation suggests that cranioplasty was not an unknown field (5) In the old world a number of writers discussed the repair of cranial injuries Fallopius (2) states that if the bone is uncontaminated and healthy at may be replaced provided the dura mater is in tact if the brain is exposed the loose bone frag ments should be discarded and a gold plate inserted. However the procedure seems to have fallen into disrepute for both Franco (4) and Pare (II p 67) speak d sparagingly of the op eration They infer that in many cases cranio plasty was carried out by quacks who pretending to put the precious metal into the cranial defects surreptitiously dropped it into their own pockets Religious tenets of the time also mitigated against the procedure. In 1670 a skull defect in a Russian was repaired with a piece of bone taken from a dog However the ecclesiastic nobility decreed that the bone of a dog was not befitting the bead of a Christian gentleman so that under threat of excommunication the bone was removed (6 p 7)

In many of the primitive races trephining was practiced by the natives usually to let out the devils that plagued the patient After the bone was exposed by a T shaped scalp incision the cramum was scraped away until the dura was exposed To cover the defect a piece of cocoanut shell was inserted and covered by the scalp (1 3 9) Although this procedure had a 50 per cent mortality in some South Sea Islands most of the males h d been subjected t it at some time

The modern era of cranioplasty was introduced by Merrem (7) who in 1810 e pe imented on

From th D From th D on t \eurol gical rg h L dogs In 1821 Philip von Walther (13) carried out the procedure in man. With the advent of antiseptic techniques and more devastating weap ons of warfare the conflicts of the last hundred years have given a great impetus to cranioplastic surgery

## INDICATIONS FOR CRANIOPLASTY

As Grant and Norcross (59 p 404) state There seems to be a happy accord among most of the authors as to the indications for cranio plasty The more common reasons for closing a cramal defect are pain or tenderness at the marg n of the opening the syndrome of the trephined convulsive states disfigurements military rea sons and certain psychogenic manife tations such as anxiety or a feeling of insecurity from fear of injury to the brain beneath the defect One or more of these indications may be present in any individual case

Pan o tender ess ab ut the skull defect Not infrequently the scalp becomes extremely tender about the margin of a cranial defect. This hyper esthesia may be associated with either a protru sion or a depression of the scalp over the cranial hiatus It is generally assumed that the pain is the result of chronic traction of the scar tissues upon the nerve fibers or endings in the scalp At times the tenderness is so extreme that any manipulation of the scalp is intolerable. The following case is presented as an example of this complaint

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Syndrom f the t pl red The most common compla nts of patient with a defe t f the skull re headache nd dizziness aggr vat d by bending or sto ping The e are particula ly pro

nounced a the first few weeks afte the occurrent of an ope on gin the skull later gradul ligh decreating in see e. Hy. They a e. prob. bly the resulted variety and the state of position of the body. Many p tentise o error better to time to complain and m y e end edge most supprioms so has easy fat builty a d. lack concentration. While unquestio bly this in cleared up or markedly alle lated by crampla's lease at the property of the dependent of the state of

Co uls e states The factor p oducin a skull defect f equently causes d mage to the under Is ng brain as the result of which pilept c seiz res may occur (383) In some instances uch as in the ase fa brant mo the attacks may a tedate the occurrence of the ope in calvar um The prec e patho eness of the co ul ve seizur is not cle r In some ca es ce e bral scarran secondary to lacerat on or hemor rhage m 3 b factor in the in tances cort orole Pacumom na eal adh na may plat enc pb log phy my show localized atricular dilatatio at the site of the defect which indicates be rt cal sea Electro ncephalograph c stud es f the case may indicat n area of abnormal lect scal act sty E en in the bsen of abn rmal p eumoenceph l raphic or electroen c ph lo ph c findings an opla ty al n ma aller to the con ul e state (59) In the cases





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as ocated with localized ventricular distation the dura mater is usually matted to the under lying brain so that it is advisable to resect the atherent dura and the scarred brain to the ven incle and then repair the dural defect with penosteum or lascia lista (62 239 382 384) Repeated subdural injections of air have been recently advocated to further decrease the lackthood of corticomeningeal adhe ions (369). Following cranioplasty for epileptic states anticon ulsve medication should be administered postopera ti ely for at least several years. If the attacks do not recur the medication may be decreased gradually and eventually eliminated.

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ldf t Aft feshing it is wh ch tn I Pnt m fornth di tak was used t th d boydit dth im t m ll h if f Ī t bl graft f th t tabl dp otumf m n w buselled d hed t th df t Sut es pa sed thro gh th m gun f th graft and diac t forth t pl t pl Th kim me ted the file ity Th p t thad bo t fixth t Th ki m gi lesc dw d schagd that the pot pet dy lith ght too ealy tidg the throat pet es it h has bee fee f ttal i min in th (Fgs d3)

Cosmet i dicato v Cramoplasty is indicated for cosmetic reasons predominantly if the cranial defect is located in the frontal region. Usually such cases are complicated by unsightly scars. If the frontal single-share been involved the disfigurement may be quite sever. The use of allopastic ubits a ters spart cularly desirable for the

repair of such large defects because an almost perfect restoration of the contour of the forehead and supraorbital ridges may be accomplished

Military reasons Because army regulations state that a sol her cannot be returned to active duty if he has a cranial defect larger than 2 cm in diameter cranioplasty is necessary in mil tary practice in order that the patient may be eligible for duty.

Feeling of insecurity. Although the actual dan ger of traumatizing the cerebrum through a cranial defect is very minimal patients frequently complain that they are constantly wormed the they hurt their hrains and in some cases such anviets amounts to an incapacitating psycho neurosis. Cranioplasty may lead to a regression or marked amelioration of the psycho eme di turbances.

Psychogenic disturbances induced by a c anial defect. Patients of a psy choneurous per onality will frequently have a marked exacerbation of their psy chogenic difficulties if they suffer a head injury which results in a crain al defect. Psy cho somatic manifestations may develop. In such individuals cranipolasty may offer rehel but the cases should be carefully selected after psy chatric consultation.

#### CONTRAINDICATIONS

Since cranoplasty implies an attempt to restore an ind idual to a normal state its performance should be delayed until the p-imary condition producing the abnormality is no longer actic. Otherwise the ope atton would be of vertempo a y-benefit. In practice there are a number of f ctors which are rel tuve or absolute cont a

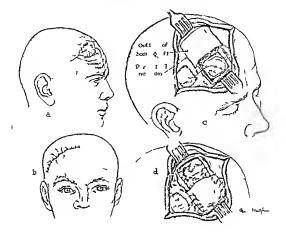
1 dications to the p oced re I isect on n th d It has been cons dered ay om tie th t cramoplasty should be carr ed out only when the wound has been completely healed and free of nfect on f r many months. In s me case e en when an interv l f from six to twelve m nths has elapsed f m the time of he ling a cran opl ty h s esulted n a re inf tion of the tis ues because of the table og isms still pr s ent in the sca Small incapsul ted absc sse usually have become terrile by this tim but the capsule and surrounding scar t ue may st ll on tain v ble path enic bacte ia In the pre nt wold wa this pe od of wating for inf tion t clear up has been reduc d to a f w week by the routine u e of the sulfonamides and pen cllin Some operato s ha e succe fully pl ced allopl tic grafts in infect d wou d trusting t th ch mother py to take ca e of th infect on H w e er su h ea ly cran opl sty appe rs to b e a

cons derable risk of failu e due to infecti a The consensus of opinion is that the wound should be healed for a few weeks before the cranial d fets repaired even when sulfonamides and pe clim are used

Abnormalities 1 il cerebrosp nal flu d'Alten t ons in the cellular constituents protein or presure of the spinal fluid usually indicate the preence of an active pathological condition a the nervous system which contraindicates on a plasty A pleocytosis of the spinal flud with t 1 1thout nthoch omia and n increase in protein is usually an indication that there is still act t inflammatory react on n the nervous vstem the most likely cause of which is an abscess Per sistent : creased spinal flu d p essure s gge tathe presence of a space occupying les o o path log cal alte tions in the circulation of the cerebrospinal flud Cranioplasty emov g the d o pre sion would precipitate mark d intracratual hypertens on which might elevate the graft ! the defect or f sling this means frelie mg the tensio gi e rie to headache vomitin i d p pilledema For this reas a papilledema is obously a cont indicat on to cran oplasts (378) E en if the spinal flu d s normal t seems at 1 wounds f the able in all cases of penetrat brain to liminate the poss bility of a latent brain abscess by pneumoencephalography (373) These entgen grams mi ht be v l able at a lat r time

if the patient et med w th fu th symptom. Fo gu b de s cuil n the b an The present of metall c particle within the head has been and to be a contra and cation to rep ir of lail defete (38). Howe e the fact that may such objects may be present in the head for years without producing u toward. Hects would tend to nevate the vew Bullets and metal in also per se do rappear to increas the incidence of abore sor epileptic timan fe tations. On the other has fragments of bone definitely ugme the the nor of infect in and b in abscess (373). If the fragme its a e not readily accessible a d anade be remo ed at the tune of crannoplasty pneuroenceph log apply would seem to be indicated in unleast the political core tent aboves.

Seet by Id and Iby There appears on executy to epart a mail cranul defect an a und d als ffering fom se e e d sability such as hem pleg. The divisability of cran oplasty in lesse ere neu olo cal disabilities must be determined by con deration if the individual case Unless the cranual d fect is eally contributin a the mid vidual sincap city to one of the post of indications for san oplasty is peent that seem no reason to carry ut the priceduce.



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th potpetu lt(b) th p fith d ld f t
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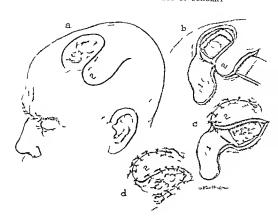
tabl fth k ll() dih grfth ld pl byprit i (d)

Epil psy The French ministry o health in the first world war (385) in a circular on cran oplasty stated that epilepic attacks of any kind contra and cated repair of a skull defect. This vier is not generally held and as a matter of fact many surgeons believe that epilepic attacks may constitute an indication for cranioplasts. This is founded on the go undis that in some cases constitute as midication for cranioplasts. This is founded on the go undis that in some cases constitute as made and defect. Unfo tunately in the surface of the state of the patient were feed attacks after cran oplasts, the latter the retiral exciss in beneft ted 100. Statients.

#### THE TIME FOR CRAMOPLANTS

Some comment has already been made upon the length of time that should be alloy ed to el pse follo ving a head v ound before a cranial defect is repaired In cases in which the wound has been infected it would seem advisable to wait at least a month after complete healing before cranioplasty is done. In the absence of infection the defect may be repaired as soon as the wound has healed Not a few operators have uggested pre mars repair of a skull defect with autogenous (1 5) heterogeneous (256) and alloplastic grafts (369) Unquestionably immediate grafting may be well tolerated in m ny cases but it seems or bable that in a certain percentage of such cases the graft would have to be removed because of the development of infection about retained fragments Since these cases would require a second operation anyway this may not be a serious objection to the procedure

In military practice early cranioplasty may permit men who have had penetrating wounds of



F4 III t t t b th in MIR s tiláp)() thinth g ftháp d(d)th pocd () thu fa (b) tháp (—th 6 lpp Th mu lt try wund try selpf df mth dft d —th d m to t

the brain to return to duty within a fe weeks of the r injury Convuls e seizures will occur in fr m 30 to 4 per cent of the group in the majority within s months of the time of injury. It important to prev in a man on dust i om h ing an ep lept cattack since t inght not only endange h is life but those of his com des. De layed epair of the defect would llo n h time to clapse to m nime the histeliho d of an attack after the p tient returned to duty. For the eason and since so much of p esent mil tary p citice is mech nixed it may be will 1 delay cran plasty in all penetratin w und of the head Pe haps electroencephalo raph stude of head mjure smay indicate the potent I epilept c

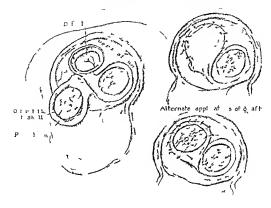
#### TYPES OF CRAMOPLASTY

The mate all u ed fo the repa f cran al de fect may be der ved from the same indiv du l ( uto enous graft) from an ther of the same

specia (homogenous g ft) for other spots (hete o encous) o form outside of the and I and on (met lor plant llop) at graft) and the dom (met lor plant llop) at graft). The call traffs were bones of the loner annual of the metals that could be easily hammered into slape As eyeer in eaccumulated and serial technique imposed the choice of the graft became more a red

#### AUTOGENOUS GRAFTS

The ideal pirofa annul difect the regeration fit biny cal it. Rarch this occur in hild en who ha e hid a prition of the skull em ved frote mpelt. Althou hat tempt ha ebe n made to stimulate osteo ner of the use o a bony defect (37 9) sat fact by climical eulits hive not yet be obtained. Auto enous bine gitting may servia a kelt in fo the ree erat not new box in this final malps. howe or the sicess of the



F ThD t Hkped h g plawthth petm th t 1 t it glipfip dhg dgraft (1 ft) hh 1 d rf (ght)

technique depends upon the fate of the trans planted bone. If the graft is absorbed a dire placed by f brous tissue it cannot fulfill it pur pose adequately but if it remains able or is replaced by living bone it is pre eminentl satis factory for the repair of the cranial defect. Un fortunately in spite of cons derable experimenta tion (10 19 25 26 28 30 41 70 195 259 7 379 380 386 387 388 391 396) a complete understands of the fate of a crantal bone gr ft has not yet been determined. Only by m n biopsies i human ranial grafts can the q estion be settled becau e the find ngs animals prob ably are not appl c, ble to man I om the clinical standpoint hove er unsatisfactory results in autorenous os eous craniopla ty are ot common As a result of bsorption of the graft Grant and Norcross (59) report onl 3 unsatisfactory cases among a series of 58 cases. King and Ande on (3) report only 1 ca e of absorpt on of the b ne graft after cra oplasti in a eries of 33 ca es

It was stated early by Ollier (10) that egeneration of bone was dependent upon the pe sosteum On the other hand. Mace en (86 300) thought that the periosteum was only a limiting mem brane and that new bone vas deri ed from bone itself Phemister (397) demonstrated that both ie s were correct as he concludes Osteogenesis in bone repriir occurs from the inner layer of the periosteum f om endosteum and to a much less e tent from bone cells and fibrous contents of the Ha ersian canals (397 p 33 ) However that s hich happens to free autogenous bone grafts im planted in the skull of man is not yet agreed upon Some investigators mainta a that the g aft is slowly replaced by creeping substitution of hy g bone from the adjacent calvaria others firmly state that it becomes lecalcified slowly and is replaced by fibrous tissue (201) Probably both iews are correct the end result in any case de pends g upon the age of the patient the condition of the gr ft and the surrounding tissues and the state of sterility of the wound

Il pt usport or the Muller kong mell od on the basis of the experimental studies of Wolff (13) Mueller (93) and koeing (74) at about the same time in 1800 levised a meti od of rep inng skull defects by transplanting a flap of skin the

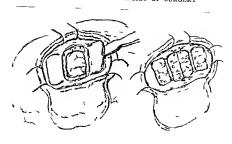


Fig 6 The blood giff the ut to 6 The ken the little to the it fither to tight deht the at the fit the fit

underlying periosteum and the outer t ble of the shull. Two adjacent shin flaps hinged at opposite ends were outlined one enclosing the scalp over the defect and the other enclosing the donor scalp.

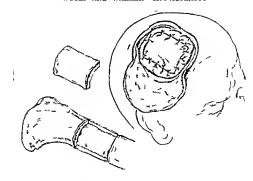
The scalp was stripped from the margins and base of the defect the edges of the bone were freed and then the two flaps we e transposed so that the donor dermatoperiosteo osteal fl p cov ered the cranial defect while the flap formerly over the defect covered the donor area (Fig. 4) If the donor area could not be completely covered by this method it was allowed to granulate or Th ersch grafts were applied Slight modifications of this techn que (81 82 q6) added small refine ments without deviating from the basic principle This ather bloody proced re d d not permit as sat factory cosmetic results as might be desired because of the twisting of the ped cle so that t was soon modified by turning a singl skin flap and using a pe iosteo-osteal graft

Per osteo steal g alf Apparently first used by D rante (5,4) this method of cram plasty has perhaps been more un ve sally used m one form or anothe than any that techn que (r 5 16 7 8 0 1 4 3 32 33 34 35 36 37 38 35 46 37 38 34 45 57 4 8 49 50 5 2 35 35 55 65 37 38 50 61 53 64 67 68 77 18 70 77 78 79 80 83 84 84 90 50 2 30 40 79 38 99 co 10 2 03 104 05 16 107 8 9109 11 1 2 1 3 4 1 5 1 6 117 18 0 11 2 11 2 13 4 1 5 1 6 117 18 14 15 5 6 117 18 14 15 5 6 117 18 14 15 5 6 117 18 14 15 5 6 117 18 14 15 5 6 117 18 14 15 15 15 117 18 14 15 15 11 18 117 18 14 15 15 1

or g al method c sated of reflectin a slin fly sufficiently la ge to expose the defect and stad jac int dono ex The penosteum was freed fine the margin of the defect the edges of which we freshened by rone ung. The penosteum was then out about the proposed graft on all 3 des but that adjoining the defect. The outer table was cleavated by a chies! The ostroper ostel graft with the turned over the defect the attacked pen ost um being used a salm or The penosteum of ploc w s pl ced aga not the dura m ter and the graft held by bernost 1 sutus (s/Fig 5).

Se eral mod fications of the techn que have been mt oduced Per osteo-osteal flaps ma) be cut on each side of the defect and then turned o er to fill it (Fig 6) (29 88 90 100) Instead of h nging the g aft (46 74) ome op rators pre ferred to slide the graft into place Holmann (66) left the per o teum attached by shn s lo ge ough to pe m t the bone to b swung into the defect. Others used the bone with or without the periosteum as a free graft (3) B ne chips alone as Macewen (8, 87) nd K en (7) s ggested ha e g ven satisfactory results in the rpi f small While many d antages we e claimed for these modifications time has demonstrated th t the e is little cause to choo e betwe n them elat ely l rge gr ft is bein used it i ad vantageous to h e the pe sosteum attached sin e the uter table will crack nd may fragment if it

n t firmly adh ent to the pen ran um The latt aloads in molding the flap to the desired



t prit lgritf mith the (1(t) Fg 7 Skth sh gth t th 1 ldf t(ht)

shape and may be sutured to the periosteum bout the margins of the defect

Tibia grafts Many sources of extracramal bone have been used to repair cranial defects. Which one is chosen seems to depend largely upon the personal experience of the operator Seydel (156) n 1889 used a tibial osteoperiosteal graft successfully Naturally dubious of the take of the graft he observed it for five days before he sutured the scalp Although a tibial graft is applicable only to a relati ely small cranial defect unless mul tiple grafts are used the technique has been quite popular (Fig 7) (65 73 128 132 134 135 136 137 138 139 140 141 142 143 144 145 146 149 151 152 153 154 155 157 158 159 160 161 167 232) If an extensi e graft is taken from the tibia particul rly if the crest is removed a spontaneous fracture may result in overactive patients Berndt (131) Axhausen (22) Bufah 1 (133) and Lever (r48) suggested lea ing a fat pad on the perio teum to place against the dura mater The necessity of two operatice fields is a decided disadvantage as it increases the risks of infection and postoperative complications Mori son (150) tates that the patients all complained of their leg more than their head (150 p 456) Rib grafts The rib being curved is readily adaptable to the contour of the skull and m kes a satisfactory graft to repair a small defect Kappis (168) in 1915 used the full thickness of the rib with the attached periosteum and fat to cover a dural and skull defect A year later Weber (174) reported on its use emphasizing the adaptability of the twelfth rib to cranioplasty This technique has found many proponents (59 162 167 172 173) Brown (163 164) in 1917 suggested split ting the rib and leaving the inner lamina as pro tection for the thoracic contents Others (165 166 169 170 171) have split the rib to gain more grafting material without seriously decreasing its strength (Fig 8) The following case will illustrate the use of a rib graft

dm tted t th U vers ty f Chicag ld bt milw Spt mbe 6 f th nght f mpo d fra t mm ted f 1 f th nght f m cord t. A th esult h tı g d fect th ght f tal m g 5 by com tic traso a h des ed pla ti fth dfraty Th ecta gui as d ted f nb transpla t O Sept mber CT2 pla ty as perf rmed A th i rm sca down on the sid Th scalp d po dearned 1 gth h ght sid t ly t xpose th t d feet fth d feet th penost m w t bo Th th k ed d dh re tdur t pped d fect At th th bra tis as esected to lea th k ed rach d

C seg (R B U th



Fg 8 III t t h g th t h q f p p g d ep g th d fect with th peces f nb (d) th sk ll () bt s p f b (b) p b tt g t f

I th m m d l gth lft b Th was th th nb cut t fit th d f ct Alg the prophry f the g ft d the d fect pld m lld llb l th d th m g gh nh h ted t fix th graft th tw l y rs f lk t dh led by paory tt wth tth of fluid b theth sclp At the time I th p ti t disch g th f th potp t th cosm to es lt w y gr tıfyı g

Illum g afts The il um was app ntly not used s a sou ce of bone f cramoplasty until Maucha e (177) in 014 repar d a c mal del ct with a graft f om the c t f theil um Phemister (180) u et il uter table and P ekerill (8 ) the internit table of the also of the ilm Naffz e (179) M neg (178) and theres (69 75 76 18) h ve iso used this bon sa ourc fignitis of the prior fishul defect it has ce tain d finite advantages or the use of the this orrow in that if ye conça oconie grafts to make the occurrent and finite advantages or the use of the this orrow in that

which pproximate the contour of the skull (Fig. 10) The p. o edure has the d and antage that two op rate e teams a e necessary the co. ale conc. delayed because of the weakness of the thick

detayed because of the weakness of the thormus les and fractu e f the pel is may result too str muou activity is en aged in early. One of Monys (78) p te is su taimed fractured pel is d nn convul e att ck soo after the operation.

Scep lag fix Th capula as sourced bore cran oplasts has the ad antag that it is or cred by p o teum n both des nd that rid tuely 1 ge pueces of h ne may be obtained. Rejle (go) nit od ced is use in 101 and suct that time t has been used by a n mber of open tors to cran oplasts (60 183 8 41 85 186 19).

Ster mg aft Muelle (187 188) reported?
cases I cramal defect rep ured b) grafts from the
sternum m 915 Westermann (197) ment us the
sternum s a sou c f bone for cramoplass;
Mnell (188) in 19 9 eported 7 cases in which

sternal bone had been used for cramoplasty. It does not appear to have any advantage over bone from other sources and has not been frequently

used (189)

Preserved bone. The use of autogenous bone stored in a preservative and subsequently reim planted in the skull dates from Macewan (85 86 87) who reported that bone kept in a corrosive ublimate solution might be successfully replaced in the skull (cf. also Gerstein 193). In 1916 Westermann (191) suggested boiling the bone before replacing it. Kreider (194) used the novel method of storing the cranial bone in the abdominal wall until it was replaced at a secondary operation. Many surgeons have removed bone flaps stored them in alcohol or formalin and builed and replaced them with satisfactory results but not a few have had to remove the bone subsequently because of a draining sinus.

Ca I lage The use of cartilage to repair cramal defects was popularized by the work of Morestin (216) in 915 Because cartilage as easily mold ed and relatively resistant to infection it was enthusiastically received (78 196 197 198 199 201 202 203 04 205 206 207 08 211 21 213 215 217 218 219 220 221 222 224 2 5 226 227 229 230 33 234 235 236) Among 66 cases in which it vas used Laqui re (210) reported only I failure Chutro (200) reported 54 cases with primary healing in all instances Tulliard (200) examined 30 cases in which cartilage had been used for cramoplasty ten or more vears peeviously. He found the defect firmly filled in and the contour normal in 35 cases although in 15 cases small areas of cartilage appeared to have been absorbed. This is not surprising in view of the fate of the graft described by Leriche and Policar I (214) who studied 2 cases thirty six and three hundred and two days after cartilaginous cranioplasty The hyaline cartilage had under gone degeneration and was be no reabsorbed and invaded by connective tissue. The fibrocartilage appeared to be living but it was being invaded by connective tissue from the host Cartilage is uellttle if at all at the present time for cramoplasty becau e of its flexibility (9) its tendency to warp (223) and the relatively sm II amount of it available. There is no reason to belie e that it has any ad antage over bone

last a The use of temporal muscle and f sca to co er defects of the skull vas suggested by Beck (237) in 1906 \times rious plastic reprirs with peno teum or scalp have been propo ed (238-240 374-377) but these methods have limited appl ca tion to small defects of the bone which usually

require no repair



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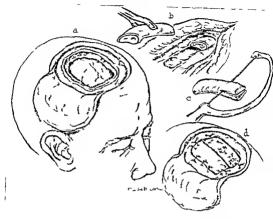
## HOMOGENOUS GRAFTS

Coda er g afts Homogenous sources for bone to repair canal defects have been limited to cadavers During the first World War Sicard and Dambini (427) performed to cramioplastics using autops; skull bones which had been placed in xylot then formaldehy de and sternlized by moist heat at the time of operation. They reported no reaction of the tissues and no absorption of the bone (241 244 245 246 248 249 250). Un fortunately however a late follow up of these cases is not available. In 1933 Pankratic (243) from Russia reported 4 cases of skull defect repaired by Cadaver grafts. Gurdjian (242) used boiled bone from an autopsy case in 2 instances in 1 of which the bone was absorbed

## HETEROGENOUS GRAFTS

Osseous e ofts: From time to time bone from lower animals has been transplanted into other pecies including man In 1893 Ricard (256) put bone from a dog into the human skull. Schmidt (271) in 1893 transplanted fresh and decalcified bone from the rabbit to the dog and vice versa The grafts were well tolerated by the host kuettner (254) successfully grafted bones from apes to man.

Senn (257) in 1889 attempted to fill aseptic osseous carries in dogs with decalcifed tibia Withough the graft was absorbed it served for a matrix upon which new bone was laid down



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Stap lag ft The scapula a as o rec of bef r crantoplasty ha the ad antage that it is overed by per o team on both s des a d that the thirds lage p ces of bone may be obtused. Rephet(po) introd edits use in 19 a disact hit ime it his been u d his a number of operators for tran oplasty (69 83 184 185 185 of)

Ster im g offs Mieller (87 188) reported a cases of crain I defect epaired his graft from the mum in 9 5 Weste mann (9) ment on shift mum in a 5 Weste mann (0) in the most his timum as a source of bone fo crin plass fueller (188) in 9 9 reported y cases in which

sternal bone had been used for cramoplasty. It does not appear to have any advantage over bone from other sources and has not been frequently used (180)

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Page 6 The use of temporal muscle and fascus to cover defects of the skull was suggested by beck (237) in 1900. Various plastic repairs with periosteum or scale have been proposed (238-240-374-377) but it esemethods have limited applied tun to small defects of the bone, which usually require no repair.



(C 3) Post ro t n oe tg gram f th g th b graft

## HOMOGENOUS GRAPTS

Cadaer grafts Homogenous sources for bone to repair cranal defects have been imitted to cadavers During the first World War Sicard and Dambina (247) performed to or tanioplastics using autops: skull bones which had been placed in vylol then formalidehide and sterilized by most heat at the time of operation. They reported no reaction of the tissues and no absorption of the bone (241 244 45 246 249 250). Un fortunately however a late follow up of these cases is not available. In 1933 Pankrative (243) from Russias reported 4 cases of skull defect repaired by Cadaver grafts. Gurdjian (242) used boiled bone from an autopsy case in a instances in 1 of which the bone was absorbed.

## HETEROGENOUS GRAFTS

Ossows g ofts: From time to time bone from lower animals has been transplanted into other species including man. In 1893 Ricard (36) put bone from a dog into the human skull. Schm (17) in 1893 transplanted fresh and decalified bone from the rabbit to the dog and vice versa. The grafts were well tolerated by the host kuettner (254) successfully grafted bones from appes to man.

Scnn (257) in 1889 attempted to fill aseptic osseous cavities in dogs with decalofied tibia Although the graft was ab orbed it served for a matrix upon which new bone was laid down Kuemmell (75) in 1891 a d a year later Dark sche itsch and Weidenhammer (192) are said to have use I decalcified bone to repair cranial de

fects in man with sati factory results

Many reports of grafte g of boiled animal bone into the human skull are in the literature. In 1880. Jal sch (253) implanted earle bone into a trephine defect Grekoff (252) transplanted calf scapula bone in 2 ca e for repair of a skull defect Wester mann (191) says he used animal bones but gives no detail Bahcock (251) perforated and boiled the scapulae of sheep and oven for his soup bone cranioplasties. In the first world war Villandre ( 8) used the skull and scapula of sheep 's mentioned previously Ricard (256) made an immediate repair of a cran al defect vith the ilium of a dog Reynier (255) took the scapula of a abbit to fill a small skull defect in a

human being Ho r g afts I llowing the experiment 1 studies of Marchand (392) I eln and Wakab tashs (2 o) Kamptz (263) and He sclen (2f r 62) showing that h rn was vell tole ate l by the t sue Henschen (26 ) an l Rehn (68 269) each used it to repair skull felects in 2 ca es. Hen cl en (261) used buffalo horn and Rehn ( 60) sed or horn-both of which are la gely kerat n Both autho a report satisfactory results after mo e than one year Henschen's ested that torto se shell

might be used but o one apparently h s fol lo ed this lead

I ory g afts Expe imental studies of Schmitt (7) and Kamptz (63) showed that ivory caused no eact o then transplanted to the scalp of animals a d Koen g (264) found no unusual reaction when it was implant d in the l ng bo es Mauch 1 e ( 66 267) g es only a brief rep t of its u efor c moplasts with ut stat gho sat fact a the results we e David ( so) maintains tl tioyis absorted

Oti subst n As e amples of the remark abl toler n e of an m la d human t ss es fo fo eign b dies it may be vellt ment on that h rd bb or gutta per ha ( 7 6 ) pl ster-of Par (27) sh t mica ( 9) gum c k (65) and cal c m phosph te and ca honat n olive o l (23) hav all bee suggested and the m ; ity of them u d fo cran pla ty with some degre of s cc

## ALLOPLASTIC GRAFTING

The v le of an all plast gaft fo the rep of a skull difect squie hy ou snee th rten the pe tiv pro edu dob tes a econd operat e field The d ffi ulty in btanin an me t m terial fo such a purpose the g eat numbe f substanc s which have b en

tried at one time or another The deal allopla.tx graft should have the follo ing characteristics It should be qu te mert be n neith r chem

scally modified nor dissol ed by the ti sue i see It should cause little or no immed to or late

tissue re ct on

3 It should not be epilepto e ic o ca cinogen c

4 It should be sufficiently rand to maintain its co t u and yet sufficiently m lleable t permit molding at the operating table

5 It sho ld offer I tile o no e ista ce to th x ravs

With these or tena in mind the amous lloplastic substances used for cran oplasts m be examined

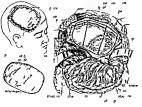
#### METALLIC GRAFTS

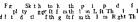
Gold and size The u e of p ec us metals silver and gold d tes f om ant gu tv SI er has been used in n u os gers for m s s r not o ly for cran op! ty but for h m stat clips o ves els Imbert a d Raynal (3 8) in q o ecom

ended it for the repair of skill detects I France Sa ar aud ( 6) and Sebile (3 9) ed t n numbe of ca es M tchell (3 2) 1 E l d u ed it succ f lls in 6 cases. Altho h it appea ed to be elati elvert in the t ssues thr us some eact on to the ord which formed o the the An added disad ntag was fond to be the discolo ti n of the skin which appeaed over sil e plate se r l years fte it had been inse ted Recently Podianu nd Manesc (324) rep ted nitsu nd called att to t certan to ic effects I gle (31 ) has also ec thy sed sil er fre pair of the cran um Neither ler nor g ld s de ble for paine larg defect beca se of it oftnes

Gold & s co s dere i b tter tha il er for cra pla ty (331) and said to be well t I rat d by the tissues (3 3) A number of water (317 345) hav ep ted sol t d cases of ep ir of skull d fect with this metal but the only large enes 5 that f Esto (3 4 3 5 3 6) He reported usin gold to the repair i o kull delects He h d deaths nd n 2 cases he had t remo e the plate b cau e of and tin Altho h gold ad sl I were u ed by Fr nch surg ns 1 W rld War I they have b nemply divery ar ly n the pat lew d cades (30, 3, 3, 8, 330, 33, 393)

All m M Altho gh aluminum w s e i the fist m tal to b sel for c n plasty it has be nemploy de tens ly I 893 Booth and Curts (3 7) rp red a k ll d fect with alum num Two years I ter Lambotte (3 o) re po ted a similar epair. The only uhsequ at re







ported u e of this metal for cranioplasty was by Flsberg (313) in 1908

Pl tint m Cornioly (309) put in a platinum plate which remained for fourteen months with out reaction. The e pense f this metal is a deterrent to its general use

Lead Danziger (310) suggested the u e of lead for cranioplasty It was used by Rouvillois (325) and Mauclaire (321) but the latter's patient as might be expected developed lead intoxication

Because of its toxicity lead is not a satisf tory substance for crantoplasty Columb um This element causes little reaction

of the tissues e perimentally but it has of yet been used clinically for cra ioplasty because of the difficulty in manufacture

Tanialum Tantalum the se enty third ele ment of the periodic series is noted for its marked res stance to corrosion and chemical reactions It 15 inert to most organic and inorgani acting only with hydrofluoric acid fumi g sul furic acid alkal's and a few other chemicals (281 282) Its physical properties are somewhat sim lar to mild steel and in the cold or annealed state it can be worked into various shap's cut and perced. Being quite ductile it may be nade into wire which can be tied or twisted

Although tantalum has been pr duced since 1903 and used in industries in past decades if w s not until 1041 that Burke (273) reported on its u e for buried surgical appliances and sutures Cames (275) demonstrated a light we ght loss of plates and crews of tantalum pl ced ag inst bone and in the abdominal wall although no g oss change of appearance was noted. It is stated that roentgenograms of the adjacent bone re ealed in creased density but microscopic e aminat on of

the decalcified bone showed no change in its structure

(R p od

The tissue reaction to tantalum has I een stu I ied in both a iimals and man Pudenz an 1 O lom (285) in 1942 found only a minimal connective tissue or glial response to intracranial implanta t on of tantalum in the form of foil or clips (283 284) Tantalum plates used to repair skull de fects in cats caused a delicate translucent slightly adherent membrane to be formed about the graft Within eleven months the capsule did not thicken appreciably This is in Leeping with Carney's des cription of the reaction to tantalum implanted in the abdominal wall Biopsies of the scalp o erlying an implanted tantalum plate in man (277 and of peripheral nerves ensheathed in tantalum foil (288 289) have shown little reaction although the tissue is quite adherent to the metal (277) Lind (288 p 1502) in describing the histological structure of the tissue about a tantalum siceve states that the layer of delicate connective tiss i abutting the foil resembled the endothelium of a vessel To date the only evidence that tantalum is not so inert as generally believed is that re ported by Delarue Linell and McKenzie (276) They implanted tantalum foil in the subdural space of dogs after traumatizing the underlincerebral cortex and found that the foil was com pletely encapsulated by a fibrous membrane. In the animals surviv ng more than three months there v s reacts e thickening of both the over ly ng dura mater and the underlying leptomeninges

A number of neurolo ical urgeons have noted the fact th t tantalum may remain in the tissues even in the presence of infects n without the production of a foreign body reaction. The inject on may clear up by the use of chemotherapy or penicillin without removal of the plate (272 274 278)

Since tantalum cannot be shaped at the operat in table e cept with great difficulty the plate must be preformed Small plates may be beaten to a simple contour by hammering over a model made from a plaster of P ris impression of the patient s head in v hich the cranial defect has been corrected This may be accomplished by building up the contour of the head with clay before the mold 1 made or filling in the defect in the positive impression. The fr t method is probably the simplest and has the added advantage that the margins of the defect are vell delineated by par ticles of clay adhering to the plaster Lipscomb and Grover (296) have made the positi e mold from an impression obtained vith sterile aga at a preliminary or first stage operation. This tech n que requires a second operati e procedure for the insertion of the tantalum. Large plates requi e shapin in a negative mold made of stone fixed in a metal casi g to prevent breakage. These plates may be compressed by a heavy rubber p d or by a positi e stone impression as described by Schnitker and McCarthy (87) Cri kling of the margins of the plate may necessitate the removal of V shaped notches where the greatest curvature is present. This does not materially eaken the plate and allows easier manipulation if the contour is not perfect

The plate is cut to allow a one eighth or one quarter inch margin about the e tire defect. It is then pe forated every 2 or 3 cm with drill h les from 2 to 3 mm in diameter. Of films that have

formed on the plate should be removed with ether

or any oil solvent before steal ation There are sever I acceptable method of m mobil ing the plate. The simple t is to tie the plate to the ma gins of the skull with tantalum wie Since the plate is only o 5 inch in thick ness it cannot be seen or felt thro h the scalp When used in p omment are s such sove th fo ehead a ledge m y be cut in the outer c ! ar al t ble t allow the plate to fit flush with the skull It may be held in place by w re t sd cr bed or fixed by small t tangula pieces of tant lum d ven nt the d plote bone (286) (Fig 11) The e gla er s points may he used as nail s they ar dr en into the skull at the ed e of the plat and then sent over the tantalum sheet Fr m three to sax such points a c usually sufficent t hold the plate firmly in place

Vitall im In 1936 Venabl Stuck and Be h
(3 4) usin the elect oly f m t ls as a method
of determining their corros ve and t sue reactions

concluded that the alloy vitallium composed of cobalt chromum and moby bettemm and what caused hittle or no electroly tie react on matema paratively inner tin vivo (200 200 20). Alth. Is the c has been much d scuss—of the electrol in method as a means of test f r corressor and ti sue irritation (9 9) the i ertness of tull 1 um has been fully substantiated (91 0 90, 368). No undue reactions to it has e be eported. Accedental infection not attre by the the plate have not prevented wou d heals abo t the metal.

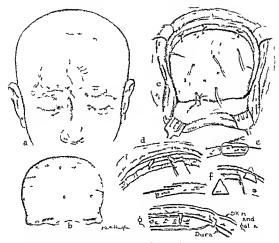
Geib (295) was the first to u e vit llum 1 the repair of skull defects. Because of the nord ty of the alloy the plate h d to be cast from a mold F rther shapin was ll wed for by nair welts cut rad ally about the periphery. In each of Gerbs (95) 4 cases a sl ht accum latio of fluid beneath the flap requed a pir ton bot the third or fou th poston t e day At postmortem e amination n x pat ent e ht m nths aft cran plasty the plate was fo nd to have the same hi h luster as when implanted It was c ered by oft fib ous tis ue which peeled off eas h Ad al defect pre e t at the primary oper t n had been closed by generat on f om the mag of the dura mater I tallium has been and na number of occasion with god esults (297 98)

The necessity f castm the plate fom a perocess mold of the skull h s prevented mar perosure statement of the skull h species of the congeons from using this techniq e (80 200). To a old the difficulty Beck. (9) au gested a stock spply of vitalium strips mm o less the ness and f varred wordh and sen the wind colle betten the ple as and used if a primary trueplasty. These strips fash oned into the desure contor rm y be placed ab out not one maps t

The n in In 92 C mpbell Me owns and Tompkins (3 8) ep ted n nother all y t con um c mpo ed of n chel cobalt chr m um and molybd num Ths all y was shown to practically aert nd nonto c I a seres f an male per mentations thy f und that toon um (ou th) plo od ces fib o s encap I t a v y m lar to that of tall um which w ad to a c ntr I when embedded n the cerebr co te a shi ht mar n 1 t sst de eloped arox d the sace neckoung them t I the two hit im tiron um is malle ble H we er its cln cal applicat n has n t been epo ted upo

St inless steel Bold y (o6) ha rece thy su g ted the u e of st inless teel wie mesh of var) m oau fo the r p r of small cr mail defeats Su h see e ns m y be c t and molded at the p atm table and are said t p oduce excell nt

c smetic results



Fg Skthh ththq ftatalm niplty Thp frm dplt (b) mm blued thdft() by chouthd highter tabl (d) th thtt gtthm g fth

#### NONMETALLIC GRAFTS

Nonmetallic alloplastic g afts have been used to repuir skull defects for many ve s with considerable success. Their light wei hi and flexibility have won miny adhe ents for them. Some of the more recently de eloped plast cs give even greater promise.

Gell f al. The introduction of this plastic for the repair of crimal defects is g nerally titributed to Fraenkel (339–34–34). Due to its production of the first in the second of the freeze at 137–38–49), then Germany (343–346–353) and I freeze at 138–353 and 138–359). Complications apparently were few but time revealed a few disk of ntages of cellulod 4 lithou is several operators have found intitle react in to the pla tic on re-explorar in after several vears (14,4 355–360). Funde

k ll (c d ) tigt gul pgs fta talum (f) r
fast mi thepli to the sk ll by tantalum ser (g) Th
mi thod f lm ti th d d p b th th plat by
tur f m th d mat to th c lp h ( dg)

(344 345) described a marked change in a plate n ed for cram plasty five years previously. The cellule d was thinner and its smooth surface putted The plate had lost its elasticity it was soft and so brittle it could be crumpled between the fingers Chemical analysis showed that the plate I ad lost camphor Experimentally the tis sue reaction to celluloid bas been studied (347 350 357) and shown to be rather slight Six days after implantation the cellulo d is surrounded by granulation tissue containing newly formed ves sels and polymorphonuclear leucocytes In four eeks the connective tissue has become laminated although it is still infiltrated by inflammatory cells In eight veeks the plate is surrounded by a thin lamma of pilo d connective tissue (347) Fol lowin a cram I repair with celluloid hos ever a serosanguineous evudate forms about the plate

which requires almost daily aspiration for from ne to two weeks. If infection does not result from this treatment (334) the plate usually be come encapsulated vith connective tissue. This immed ate cellular reaction is much greater than that seen with auto enous or alloplastic cran oplasty using tantalum vitallium or methacrylate Before the introduction of these newer materials celluloid was used e tensively (56 112 336 348 351 352 355 356 358 361) Ney (355) reported a series of 300 case of celluloid c an oplasty with only 5 infections Four of the e patients were subsequently reoperated upon vith satisfactory results

If thyl methac ylate The acrylic resins have been kno n for many years but it was not until 1937 that they were generally used as industrial materials Because of their properties it was soon recognized that they were ideal for dental pros The lack of tissue reaction to these resins in the mouth su sted that they might be su cessfully implanted within the body for arthro-

plasty and cranioplasty

The methyl methacrylate resu s made from bases derived basically from coal air and water These are converted by I gh press e meth ds into a clear liquid-methyl methacrylate mo omer The trade names under which this p r ticular type of acrylic res n 1 kn wn are tacril c lucit ple i lass or crystallite in the processed form it has a tens le st en the f from a oo to 7 000 pounds pe square nch and c mparat e and flexural stre th of from 0 000 to 15 000 pounds per squa e incl The pla tic begins to soften when heated to about 50 F Methyl methacrylate is not affected by we L acids and alkal es but it is sol ble in ketones este s and ac omatic hydroc bons. The plastic ab bs small amounts f vater with ut chinama its chem cal st ct re (365)

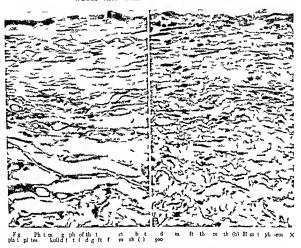
Kleinschm dt (370) was the first to report on the use f methyl n ethacrylate (ple 1 la s) in e perimental n mals In J n ary 194 he n se ted pl te of ple igla mm thicknes in skull defect of rabb ts. In ten day, the f the pl te a cover d by int tt l cell ly n n a pl sma mat Collagen (b sapp thre w ks firmly envel p th plat Αl dher d to th dura mate the though the t ss s bd ral tructur sho d nor cto kle schm dt ( ,o) st te that Z nder w th firtt u e this pl tic fo hum n cr m plasty rep ng al e defect n the f ontal bon if Oct be 1940 In this cuntry the p dic surge is (367 368 372) int od ced th newerpla t csf arthr plast In this claim thyl metharylate his been sed

for several years (175) Originally flat plates of lucite 2 mm in thickness were processed a d then shaped hy heat ng over a plaste mold g cause sucl plates tended to flatten d ing autoclay ng the lucite is now proces ed in ca ts of the head much as dental molds are made. Gurd an et al (360) and Kahn (369) have sed meth crvlate successf lly fo cr n opl sty with god cosmetic results. Kahn believes the material to be so mert that it may be inserted t th time of primary repair of a perforatin wou d fthe head.

While acrylic resins are well toler ted by h man and animal tiss es (362 363 364 370 37r) there is a definite e capsulat on of the plate within a few vecks by hyal e connective t suc (F 12) Relat elv little infl mmatory react on i prese t That this tissue respose is mor than that seen when tantalum or t ll um 1 sed cann t be stated from the few h man cases in which t have been able to m ke biopsy at dies. The plastic does not appe r to invoke a f reign bod r ct on even in the p esenc f infect n We have seen an infected wound p obably due to too ea ly acrylic cranioplasty fo a compound skull fracture clear up completely with local and 5 5tem c penic lin the apy vithout emov I f the plate It s parts ularly n tewo the th t follow ing repa of a L ll def ct with a meth cryl te pl te a prat n of flud nde the fl paelvi red r d mo e than once and ir some ca e not at all

The ac alcol te scast fom nold m deofthe patient's head A plaster of Pari impeso of the cran al defect and s rro ndin e o spre pa ed nd mold m de ot it The mold h ld be p red down 5 mm to llow f r the thicknes f the scalp and the def ct filled n to app oumatel) mon f the d s red cont r Base pl te w la d in to fill the defect Th m ld i greased and co nte m ld is I epared by mak n an mp essio of the m ld and wa in the defect Upon spaan f the fik the warr moed d the adjoin n s faces of the molds re moothly h ed by tha sheets finf l

The acylem teral prepard by me gth plyme (pwde) dm nom (lqid) About 8 ec of the mied meteral me aplate about 2 by oo by 50 mm The thi L t cky m vt es placed 1 th mold nd th co te mold appl d The two re then mpesd by hear clamps a d pl ced in wate bath at approximatel The state of the s



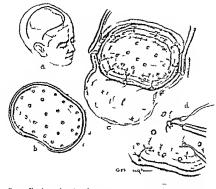
to F for one hour. They are then boiled about forty five minutes. Slow cooling prevents stresses or strains in the material. Upon rem. I of the plate the margins may be trimmed and the outer edges beveled. The surfaces are p lished on a wiel. Perforations are made about 3 cm. apart.

Stenibation may be carried out by immersion in steriliz g solutions If autoclaved the plate should be bound to a small mold to prevent distortion. The wet heat prod ces as hit transbucency of the plastic ithout otherw e altering its strent had consistency. The plate is inserted and fixed in much the same manner described lor other all plastic gr fits (Fi 13).

#### PO TOPERATIVE TRI ATMENT

When o teoperiosteal fragmented grafts of the kull are used to repair cranial defects it a dissable to prevent undue pressure on the graft until bont un ion has occurred. For it is purpose a plaster of laris cast ma lefitted to the heal for

the immediate postoperative period. Later a plate in the patient's cap will afford adequate protection for the defect until the graft has be come solid (381) When more sol d grafts such as ribs tibia or flum are implanted this precau tion is unnecessary For such grafts and alloplastic cramoplasty a pressure bandage with sponge rubber sea sponges or mechanic s waste to obtain an even compression is placed on the head to prevent the collection of fluid under the scalp If the pat ent is kept flat in bed for the first fe lays f llowing cran oplasty the dura mater will tend to rem in in contact with the plate and thus el minate the dead space. If the patient is ele vated the intracranial pre sure is decreased v h ch allo vs more fluid to I'rm under the plate. It is true that the dependent position predisposes to venous ooz ng but the use of a pressure ban lage and the intracran al pressure tend to keep the bleed ng to a minimum The compression band age should be left in place until the sutures are to



be removed in three or four days. If cons detable fluid has accumulated under the scalp at this time it may be purated and the piessule decising e placed. With osseo is tantalum and metha crylate grafts asplation is rarely required on more than one occasion and at times in the fall.

Since many cranioplasties a e- pe formed for the rep 1 of crainal defects due to compound if cture of the skull n \ h \ ch \ a certain mount of infect n has been pres in it seems ad a sable to prepare the patient if rope ton by systemic ad in sit ton of moder te for its person sulfin and sulfad azine. This 1 particularly imperative if the per od of time nee the infect in h been short. The local 1 placet n of these hemothe ap utic gents in the wind h is been re-ommended.

#### DISCUSSION

Peh ps the m st tonishin find ng m a e view f cran pla ty the great tl nec of hum nt sues f r f erm bod (389) The is und ubt dly the an nt t so many different typ of graft h veb en st d and used f r repai of the kull with u ces flr ults To

ch ose the deal from these no easy task be c use none meets Il ther quir ments of a pe fect graft H wer fo c ture tiations some appea to be more suit ble thin othe

The en no doubt that the alloplast cgr fts tan be molded to more comple conto r to p od ce a cosm to esult superior to that obtained by other typ of g aft Su h sh pin of th graft! pecually necessary in the font I region a d for defects in this evion all plast c gr its a t par, t cul by de trable Fr defects n the parts of the skull where the cosmetic es its are not so impo tant the adv nta e f alloplast c ra oplaty s not s e ide t The introd cti of s foega body eva if iet nitally may be espons ble fo the I te development of care no enc pil pto nc or ther equel e The lack of an mmed ate t e reaction e pec ally in ex per in tal animals no guara tee that a late ea tron may n t occu. The omewhat smplet and ho ter perat e procedu e shen ap f rmed plt s sed not nent ely dequate reason f ts u e sal dopt n for e an plasty Delect up to 8 m n dam ter may be epai ed at a

s n<sub>b</sub>le and not too lengthy operation with osseous grafts either from the skull thue alum or mbs For repairs of smaller crannal defects the osteo periosteal grafts from the outer table of the skull seem to be well suited. That osseous grafts are absorbed in 5 per cent of the cases does not seem to be a serious disadvanta e. For the repair of larg defects for which suffice it bowe can be obtained only 1 th liffculty the alloplastic grafts are describle.

The choice of an alloplastic graft is not easy Only celluloid which is ob jously inferior to the newer plastics and metals has had the test of time That all the others will remain mert in the tissue for from forty to fifty years remains to be determined All of the newer materials-tan talum vitallium ticonium and methacrylateappear to cause relatively little immediate tissue reaction. The metals and alloys have one distinct d sadvantage not possessed by the plastics name It their radio-opacity If roentgenograms of the skull are not required following craniotomy this is of no consequence but if a complication de velops the large mass of radio-opaque material is a severe hand cap to adequate roentgeno-raphic examination (Fig. 14) In cases in which the dura mater has not been penetrated late sequelae such as epilepsy are unlikely therefore metal plates may be used for repair of the skull defects with little chance of their interference with subsequent roentgenography. Ho ever in those cases in which the dura mater has been penetrated of which about 40 per cent will probably develop epilepsy a radioluce t graft such as methacrylate would seem desirable. Although both pl stic and tantalum plates at pear to modify the electroen cephalogram the alte ations do not seem to be sufficient to interfere seriously with the interpretation of the record Perhaps as the result of World War II more defin to information on the advantages and disadvantages of the various methods of grafting will be made available. At the present time the cho ce of graft appear to be largely a matter of pe sonal experience and opinion

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шът CR L T C 50~5 ELLA S Med Tm L d G Ope um secu d ccessit t m Operattd Jhn. P tn M ph **\ 1** lv + 49 344 PP f ti 1 Wech I Ftz 5oo \tu 1 th 1 \$8 F A. despates 1 litt t palles d hirurgi l q ll des h ru gi es cerce t Lyo V ce t 556 h m es s Leo upo R \ II try [S gry s pp New 1 k Froben I'ess 943



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### NOSE AND SINUSES

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THY F D LPH M D

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tal ty rate too high and that a t of l ss than per cent in keeping with modern su gical p cedu JENF D LEI NID

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John F.D. p. M.D.

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## SURGERY OF THE NERVOUS SYSTEM

#### PERIPHERAL NERVES

Il rrmann L G and Gibb E W Phant m
Limb P in Ir Relation t rh T rm nt f Phant m L rge N r es r th Tim of Amput tion Am J S g 945 67 69

Phantom l mb pa is d c ssed by the auth is hoe pres 1 th op n n that ch pa n (at least in part) may be det penpl al r tation They d n t believe that the se sympt m re p ly psychic or in but that th v ha n organ c backe ound Argume ts favo of a ntral r gin at s pp rted by the stateme t that e ci n of a n croma should g ver leffr m the pain if it a fper pheral ong but such ne omatous esect n seld m gives a tis factory results Stud s se m to ind cate that bn mal refle sf om the pe ph ry to the h gber c t s f the central nervou syst m te d to becom fxed or revers ble 1th a short tru afte

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Th authors ever s ti pin that the m st probabl pr may a e f ph nt m limbs n ton rp m sults from ir t to of ce trally d ct a on s ith nanc ma or at the pr m l d fafr shly cut m d rv Suhao es f m ly b ughtimp is t th high ce t sir mith pit whichhab nem ed It t c ssary i I tat n to p rs st ce the ab ormal ril es

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rv tru 1 -about ch bo th site f mp t t Th lg ru c trl bl d g fr m th nut ntart ry and cau e a narro I for sur f the ners inm d t ly b eath th 1g tu listol g 1 st de mad upon l ge nerves t ated nth smanr h wagr lual replacement of the area I pres ure necros s by fibr us tissue unt l after about one month the ep: eur um completely e cases the end of the nerve e cept for a sm ll a ca of d se fib ous tissu at the e tr me end The dis tal port on f the nerve is r ect I ith the scalo l just belo the port of lg ture

Of 1 patients 113 ere dequat ly follo ed up.
Thy c p rien ed no ph nt m l mb pain f llo ng operat on by th s m th ds Analys's of the 7 pa tient who complained of phantom limb pi re aled that all but wer in the sixth decade I life and that 5 of the 7 had g agrene du rte al nsufficie cy while 2 h d vte sive arte

rial thr mbos s in the viremity HOWARD A B OWN M D

## BRAIN AND ITS COVERINGS CRANIAL NERVES

Adlr A M ntal Sympt m foll wing II ad In Jury A St r stlc I An ly 1 of 200 C se A h Pyh 1 Ch 945 53 34

A review of the psych at ic spect of 200 as a of h d njury sgvnasa part fother eu olog cal stud s in connectr n w th th s same s ries of cases wh h b d bee r ported els wb e The pat ents ra gedf m fifteen t fifty fi y rs of age and pre s ted h d my ries which va ied in deg ee of

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cup to sad pree stng a xi ty stat s with me tlsympt ms we sep rat df amith gin rlg oup of pate ts c mpl 1 1 6 f headache and 53

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G Idring D H tm nn A F and Maxw Il R dM nag m nt fSet re Infection 1 la I f nt n I I nt d Child AR iw f E peri nce Since the Int od cri n f Sulf mid Th rap M ni gococcal Infection J Pediat 945 6

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More extensive l ss equ res a transplant Suc cessful tech q e embrac s the sutu ng of the nerve sheath only av dance of to sion a d angulat on JOHN R L NDSAY M D and abse c of infect o

### SPINAL CORD AND ITS COVERINGS

Raaf J Te tment f the Patl nt with Spin 1 Cord Inj rs Am J Sug 945 67 63

On the basis of 63 cales of spilar digury an attempt is mide to ration let hit treatment. The ca sared vid d nt n cut eries of 33 seen f om one h ur t thirt n days afte the injury and a chonic seres f 3 ca s s from n month to fiftee varsafter the 1 j ry Th fi t 33 cas smut be th true bas s for the sug ted tr atm nt

The sympt mat lo y not ent dit but em phasis is la do caref I handling and t prtat on of the pat ent Wh n sh ck has b en rel ved the quest on of operat on comes up. The a thor has not be not traffed with the ide ties foth restored aga t mm diate I m ct my nd ff the f l low g nd cat n f r mm d te p tin () the pr se ce of neu olog cal sig s h ch indicat that the cod les n is pres g (2) n i complet c d th crda d less nwth vide ce of press c ted by ro ntgenog am spi al fi id bl k (3) th dem strt n that the pral fluid pathway he he was op filler gill yib com gblick d

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N M D

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raaly ed In 1 sa h a t nwa prydtoh be 1 tb p t Th comprbl 1 14 1 1 1 (i) 3 cases I supected t the left with trir I gate by p t () 9 case f comp es f the lumb otby anll daralen i pe alclc it gf nafr t red 1 mb rv rt br ( 4 fth s n) (3) 4 cases I qu st n bl d lt fid by op rat (4) 2 ca b th perated p cong ital dife ts ih t thrdm trabl f a a 1(5) 3 c s s of b k 1 a

The ge and sex of the patie t with back or le pain or the durati n of the pain were f no a d in dist guish the hern ated d sc cases The h story of a lift ng stra a back injury or a fall as the pre cinitating cause of the syndrome s in favor of hernia tin but by o means excl des the co ditins found n the second se es of cases

Recurr nt attacks of pain in the love back a d leg ccurri g first a pain n th low back which s ncreased by c gbs g sneezing or tra n and releved by est rorth ped c tratme t are some s hat mo e ind cative of a h n ated 1 mbar d sc th n of the oth c nd tion Th subjective symptoms appear d to be of no valu n ascertaini g the l vel at which the dic was ruptured when rupture xisted Lo back signs such as lumba muscle spasm

alteration of the lumbar curve and/or local tend r n s were food fferent al value in the two s ies It i of int est that the e was an ab e cc flow back s as e clus we of local tend ne s in one fifth of the

edd sand in o cth dof the other condit ons The pres ne or absenc of a pos tiv reaction to the straight leg ais gor La u test was lik w e fino diff ent l'u lue Test which produc t mporary i creas of the i trac ani l pressu e such as c ugh ing st aining o ju ular ompres on andr sult in a 1 accentuat on of p : we of co d able diff ren t al diagn tic importa ce h i f u d pos tive in 86 p ce tof the hern at d disc ser as opposed to 44 per cent for the ther ser s The pe enc or ab ence of moto w kn ss o refle changes in th involved l mb w s of no d agnost ch lp d about on half of th patients with vinis didisc berniat o had orm 1 Achill's fle s Muscula at ophy as 3 t mes mo e p evale to the pr ved hermat on group Obje tiv se ory ch nges were abs nt in 37 p r

c t I the pr ved her ation a d in 47 pe cent of th other co d tio a d h n prese t e n ther f d ff ent al nor of local zi g s g incane

Wtbr arl to local zat on f th lvl f th hern tion t the vafid sees objet snoy hag the secorbe eof postie Las gu gno obj ti motor ale wa fn help Loss of the Liege k as ob rid non half of the I mb sacral uptu es but in nly o e th d of th futblmb dchnti Atrphy was t c f qu nt i f urth lumb r-d c r ptu e a l mb acral rupt es Cr brost) al fluid tud s

we of 1 g ostich lp Ctilg sof the penc of pst tdis " fm lt pl h ated I cs and th

l lith he ation thematicus de dui n vlos phy 12 pe ent solution of hod n n t lled intr th cally the most sat sat tye nt at m 1 m M s | no The i | ct | mat r | ar r thy fill the r al subarachn d path ays trly the for fluo sc py 1 not equird d the It ns to by book d nt hors It cass lyar nequatilam at fm ngel tat bt pinalan lesa mu t frestb d l ld taled lesc pton fth use fskoda nmy aphy is t be repot di an the publicat

Thee I on reach d th tel c I am at on lad t the susp c f the pr ce of a post 1 r herniat n f l mbar d c nd c t t myel g raphy poves or d p s the susp on and d t mines the l cl f the her at when it spesent H YAS M MD

Ehnl G and Lo J G Intra pln I Lipoma Repot f Ca R i w of th Llt ratue and Clinical and P thological Study t h N P 3 h 1 Ch 945 53

Very cl se t ip c tof intrasp alt mors are l pom s Th efiths of the lp mas e intradural a dt offths are e trad ral

The d t h tonh t con the sexes is ab t a 1 for both va ieties of intraspi all p mas

The nset faymptom f t d llpom s with few e cept o s h fo eth ge of two or three years at the beg ming of the th rd or fifth decade Symp tom of tad allp mas app arata yag

The dur ton of symptoms of t d ll pom s (before death or surgical removal) r nges f om few months to mo e tha fiftee years. The median duration is about for y as The durat of symp tom f extradur l l pom u ally sh rt the medinb gabout one ye

The clinical pression of ntr d allo ma s d t ctive fo fiv reas s () d fin t o t pa s are c mmon d pt the very feq t vle ment of ts in the t m (2) ataxia of the t m t sdue to d fict f po to s se is occa o lly o of the first m festatio of the l pom (3) lat l flaccid p alyss of n a m assoc t d w th sp st paralysi of the legs h bee obs rv d (4) c molt uba chn d bl ck is usuald pt the large siz t which th tumors g w (5) d ver ble ch ges i th p al ro tg g m may be bsent b t n th th rhand th spn i a alm y

b wid ned tho hac sd bled t Int dur llp mas ccu m t comm ly s the ery tho c g nofth p alcod E t d ral l pomas m t comm n the l a r pat f th

th acc g n
All but f the int d llp m wee m p d f d ltadp t f d ltadp t s wth cessiv fib trm O lyh lf f th t adural lipom w re f d lt d p set ue M t f th rem nder w ng mato A few we

my m tu On as femby eft R ttry ridth at dall poma mm tof th es dtw mmont theftlygn s h nt m t 1 t th fine tru t t tldt th uppot thtth ftdvl pd wthn thot dddnt filtrat it nd nlv

ny ably f d t h I trd allpm p t df mth e lt ehy laye of fih t of pld tn Ap h the rs the f rf fth tm Th f th t d d llpm fpl gn
The ct t f tdwthp IIpm

how t ch g fap lif t t ()

th nd m ft vrs ot p lifrates t fomp metfibocilularm with the base ma () the p 1 ptum b t the t m a dth c d thick ds dh vyete as mt th c d a d (3) th pal cap I over the if eath tum r thi ke s and m y b come adh t to the arach od and d

The ppar t vn softhec ect has with regard t the co disprobably ta express of mal g cy

P II pom s p obably arise because of localial of o mal contrler frmat n of ftf m the no maily pre ent p neap llary m chym i ch In thes cells which h fat f rm p t thu apa c l adp f th pap c d t de lp Whith the n plite samfirmte, ydff cebtwe thet o h th th is an oping to

Extrad 1 1 pom m relat d t m agu d fect of the p mts ftf min ts tsli N ther form of lpm sreltdt mm nm The saclo 1t shpb twe 1pm ac g mas I t aspin 11p mas ppe t be 1tc fib m to d the th r pha m to m

rath ft sctdwill tal def ct int d rallp m Obesty d m ltpl lpo a occaso lly accomp y th trd ralipms

### MISCELLANEOUS

Jdvih B Sm t Pin D gn tc dTh pe tl A pe t fLoc l I filtrat 4 Ji 945 99 4

I cassof matepat dm th m f cto f r d t mn wh th r ) ti sh d be g ven I cally o wheth a par rt b l n blokshidb d Sprfi alt dru istes dru fth Lint p ch llashypralges t p p ck p st k D epsknt dem let donly by pligo pr gth sk firmly ag st m le bo trut e d tbyp
p L p h g Th latt ft n otl keli
d qe tlyth d on s f n almamaybe
el ok d

Judyih dvd pa to the mit ipt iclt smittdad fie P fth lcal ty Im ted t g th t w th the a mp ny t d to th a of voleme t E amples

th type fit t my t d tad ts
T mttdp dal gtt ref
r wth th gme talop pheral kap t
t m w h d tem d by th d t b t fit re fa dm The mpl of trul tt sin bd ma l eh t lga scrt brahl Pin is optiler mitd
Rfip p frrdfom mitd
mut tet t dt t whinth a
sgm tinry t Th f edpan sat

c tdwtht d

S mat pa myb c mb d w th ymp th ttc pan d lt n f g l l p cture A p tc te cale mu l may b d rily

affected by local shoulde soint l sio a a b tis tend tis r fibros t s II wever local nfltrat on nto the scale us anticu muscl vill le the sc pula 1 fr ! vicul r l arm r I and

If any other local l ab ut th sh Ider to at is pres t it will not be rel ved and it can then be sharply localized the verlap of vasc lar and n uralgepan and t nde ss f the scalenus yn

drome having b n eras dfr the tm be ng Los back pain sdyded int the typ with nd those athout adiat on Radiating pai s m y b r tra smitt di type If th r f red a as

f pain ar tend r it s the t nsm tt d typ h ch n fies there is r t or t u k ritat n and that therapy shuld be direct lit the plarea Para rtebral te d rnes will be f nd at l 1 6 sp d g to the p sph r l d t sbuts Local nal

a al L w trati in s ch tuat ons vould b of back pa v thout dat on a dv tha s flocal tuder saa it nd to myost ribr tsad local nfilt t n sh ld b sed

In astanc s of segm tal n u alg a local afiltra t on into the pe phe lar a of pa may case ces sato of p in a th ent s gm at H er ths ill be o ly temp ary nd apra e t brai fit a

t nof the my lyed erve truck all yield more satisfactory sult

Differ ntiat on of the ourc of p in according to the pre ce or abse ce of tend ness has b en found to b more cour to than attent; to the ar a of pan Thus s gmental p in a id t nde css may per ist for months or y ars fite the sub de ce of the acute symptoms of a b ck min y Eff rts t el eve area of pain by local 1 f ltratt n pe phe ally are of Ittle se H weve parave teb al blocks of th nerve trunks respons ble for the segmental tender ness will result in prol nged rel ef often curing the

c mpla nt of pa n Falur to btain r I f f pan following paraver teb al re block my be det impr per nfilt a t on of th nerve t unk This would b r ealed by fall re to r liev segment I tendernes Shuld seg ment I tende ess disappe ra dp 1 still je sist it may be cau ed by () alson pr mal to tle po t f infiltration which would be int asp nal su ha a ord tumo or hern ated 1 travert bral d c ( ) I cal less n rlapp d by a zon of egment I neu

r Ig a (3) a v sceral lesio c ist g with the se mental ne algia or (4) unw lling ess o the part of the patie t to adm t rel f as in comp sation pr b HE RY A SHENKIN M D

# SURGERY OF THE THORAX

#### CHEST WALL AND BREAST

Lubs hit k P g t Di of the Nipple with Special R f n t It Co rs and T atment A1 d 1 St kh 944 5 7

Durng the podfm 99t 942 the nmh of cases fca cer of the b stt t dat the Radium Ce ter in C p hage as 967 amo g th m were 27 ca es (2 9 per c t) f Pag ts d se se The pa t ents all men from the ty nine to ighty y ars ld mot fth m between si ty a dei hty In all caese cept r th dag ossw v fied by

h t logical vam nation

Probably the P g t c ll are cell the o fic s of the milk d ts r the ud ferous el nds a he h be com cance iz d and 1 v d the epid rms Such a cance at n m y ccur s m ltaneously r succ svl tv us pot f the ca al syst m f rm d by the milk d cts and the race toward the sur face of the ski being sreto the eczemat us ch geitheltt and t ard the epeliyers h tatfrstm ypers tapreca usch ge the pthl m of the milk dets de nly lter g er, t the f mat on fap lpabl t m r wh n th cells h ak th ugh the b 1 membane nd beg n to infilt ate the s di gs As a rule the a ce ed c ll in th deep p t f th m lkd ts d not a sum the f rm and type of Pag t cells It foll s f om the f ego g th t iy a la tvlyl t t g f P t s d ase can we xpe t to fidtum f m t n theb ast by p lpato h t by t pa to dm cop b op y dm strabl ch es n th d pth may h f de l r- th fom ftm lil hg; the epth lm f th d ts— d th f tatm mof rbl f the sttt fth py ftm t oth petd hwe that the then gwll alway gvap till tind btful es scd

gvapti it in a bittil es se u
b pyb ldb p f m d
With the cpt f Bl dgod h e pess d
the bl f th t t a ly tag the d myb
cu d th d matol c l t tm t ll w ts ad cat d calop t T the ton th d mutbe dddt tm tby tg rywhch hwyd nt pp th h tho hly tdn I g cal wh Atth RdmC t Coph 1th 7

fPtd fthbt t 14 t tà s g cally while seg tg nt tm the flyf ct lhidt the tm the lightly p et atig rad t I 5 ca thiw th gical pra nly th apy g whil t w primdlt hea f rr O th ppt ts 43p t lv fiv y rs ft th teatment Of this t to with ray 63 p c twr lv ft th fiv y p d A mp f th es lt bta d th t t mnt fP t d d f p hl h t

ca c h w that regard t the lastin re ults odff c b twe the frmer ad pe able m mm ry ca ma t at d with radial pe at n and po top rat v rrad at (38 per ort of ttal faocs ympt m free f f ye rs) wh as the op bl m mmary ca can

which g n pre p rat tgen t tm t strong do bef e d cal perato eem t h a moef abl curs (5 percet fatul of 3 cases w ympt mfff jars)

At the tech q 5 ca the irradat is ge tru low oltag short-d ta t tm t, f mad tace of bt 5 d7 cm wth 6 k dfrom t am filt dthr h mm l p ca es the first tr tm t was git &

mo deep g ing stll lat v ly sup mi l imada to thiom co to 8 kv t 4 ma t 3 mm of 1 m um diomad t ce of bet e 5 sod a cm Th t tald d f om 3 000 to 6000 ent s g n fract o l m Only in cases was t atm t co n th whl beat g with m pin trat graduat 8 k 5 mm fcpp add t 4 m Th irraditi as I frat linth ca bttbettaldoe as n erth les rath m d rat ca. 600 d n the oth 800 0 t e t ns d d in d quat with the tichniq w mo the sympt met eff to bta dinasstacaset belm the yers to lyth P t fiet the ast as completed he do by rent mofrmet has app d the pe

part fth m mm rygl d JEPK NAR MD

TRACHEA LUNGS AND PLEURA O h lt R H nd W 1 n N J Pulm ny R ecti n in th T tm nt f T bercul 1

Thor S & 94 4 55 Res t ftb l t

with ch m f ftytht t huldbun cldd thath posb! mathd h asda t h g tapl ftr tm tf th culos Thetpt fligt in edb d 1 f t 88 Block t b culos t m d th first tt mpt t p f m ch pe t Hy most fith pots pulm retained that he h pp dd ghtepat
t nf the l h pp dd ghtepat
t y rs I th lyp t fth past dead et
lts d g Th pe t m tilt
was h h dth d f compleat h tltlpdmpmdb hlfistlwasphbtlyheh Hrm h l fist l was p hbt lyhgh H rm t pe c a d potsh h n muchm

n ragig The lpm tf pet tch q e esp livth I diligt the ftest g the h lum and the pleural fl p m thod of cl b onchus h s made the ope atme p ocedure uch saf r and has g eatly educ d complication The p es t report deals w th 63 julm ary res c on pe fo med pon 6 pats to ith pulmonary ib reuloss from 934 t July 943 Th first oup f 18 | t nts w op rate i up n hefo e Ja ary 1 1042 th ca w n t s tandard elas th s c nd g oup f 45 es cti n p f m ds ce aty 942 Of the 63 of er t 35 nect mies d 8 were 1 bect mes The ge of septi ts vared f m hft t ffty en m t them ber gb t t ntya df tvycars fage ifty-one fth patie ts ce me T nty thre tents o 37 7 p cent had e I bronchial t be ulo s Fity f e or go per cent had post e

The latte s fo operation included occurred uppu at ed e o ca es un tolled d'se e olf igth acpl tvi i ext sv mult obar p dom nately nil te al t b e l is ases p dom ately nl ha t b cul n s ca e asald scase in 7 cac and ecu th morh ge

ollo g the oplasty t be cul and act ase f llo ing eav nost my n cae a h C mpl cat neh v bee r fue d m te saily

ere your port, fi the gr p f 8 esect as done f c la arv 104 there i r 7 cas fempy m scases f perman that la and 3 ca e fun at ral p ad I th 45 r sect s do e In 18 y 1942 with the impred techniq the er ica es of mpyema s cases f contr I te al p ead ind only pe ma e t f tula Th total p r t ve mortality s 15 8 per cent d th total ca mo tity 246p et flow th oper t m tal ts in th abl r ks a 63 perc tempard to 43 7 per c t for the de pe te case Th ca Indesper tern ks 56 p t In the 45 p t t bjet d to the mpoed teh getb p t

motal tywas r per cent th 55 pr t fr a onable sk a d 33 3 pr ce t f desp t k Ot 5 ca lya 11 ted aths 7 r duet t b culosad8 to ther cause

Of th 46 m ingpat to 34 e 1 call ell T ntys he etu ned t m 1 t t a d th ther 8 ar still sa to m r t h me o modified est l'eadlt lpt ta libut th r sputa ha r m ned po t e T pt ts haep g veentrlate I tub cul s ha e res dual d cas i em mg i bes n th sid lop at n Oept atd lopd pedt th ppe lobe follows gl b ctomy fth rghtl e lohe and is no vell f ll ing I bect my f th gbt pper and middl I bes O e pat ti a resp t 3 c ppl and h sa empyem nd a fi tula ma ng patie tree nth d I peda b o chalf t

la and empyema i m thatt p m ct my.

It shely dith tresect of thit breul lig doesn tipes t litech cald ffeultes. While empleatios has burdeed c talatri p ad and ulcerat of the br chialst mp eman

as ha and Act v duea e t lerculous b onch tis o a controlf d contral teral di ease are not consid edc nt aindc tions to e ection R sect on should he employ da definit v the apy bef re the compli cat softh ougnlds ased velop

THOMAS F THORN N I M D

Sto k y P F Lockwood I H Mant II L Buckingham W W and Othe P ni illin Th rapy in B nchie to i S # 1f J 945

Bact 11 g calf lig in th sp ta of 21 ch c thers (fr chiect sis br chiti a d allere c br ch tis) d m strat d that I tile aid w uld attain f m the u e of sulf drugs This ha be n b ne out n cl cal pact ce One r mo e path gens we e u ually p es t St phyloc cci w e the most co istent a d pers te t of th patho ens and n t n frequently o 3 st ins cr p es nt Both he noly teandn h m lyteo ga sms wer pr s nt Among the strptoc coi the g ec pgm nt p ducer va most commonly fou d Nonhemolyt ca dhemolytic to ptoc cawe e freq ently son The most com m ne mbi at was one fo m of the staphylococcus th t ptoc c us vir d ns

T enty-o ca est ce dan v age of 1 000 o uits ip clinbyint m cul anditav nous i jecto in from ght to tind ys ' d eff ts were not d Bacter log lly the e was a decreas n the umb r f bem lyt c str pto oce a d sta phyl occ Thr wa a slight luctio i th go the fin hemolyte ga sims. The olume f put m as out flu c d b t from a cl cal ta i post cas show did ee fimp mint Chro e br chits ass cat ! the pe ods of et vity an ! r miss ong , th best h pe f th ap ut er pons

The tue b h ctat sho ditti r no spo e top clln T OM SF TH ENTO JR. M D Ty n M D nd Millik n N T T tal Pneum nectomy f B ign Br nchial Ad n m Case R p t tm J S g 945 67

Tho gh h ch lad oma has b come definitely s p sat df m b onch al cancer a d other b n gn b nch lt m rs om pect f the lie hist ry f th n plasm ar still larg h of cue It 1 li k n that the l n sl wly p gr ve occ rs the maj ty i ca i men i the th d or four th d cad flif and that in most instances the child g les in the ffects f b onchial ob tru tio p duced by the growth. The ach v rying pin is as t the oigh d path gines

Ith t m Offate th r ha b en asyngt a d the vi wpo nt th t th t mo u u lly be ign but m bec m malg t Th pos lilt of male na tch g n nyg n tance f d n ma wo ld certail mod f th type of th py propos d n s cheases dith frequently potidit atment f thes less 1, end bro chial remo 1 often om ble dwth d p r) the apsord ct rad mim pl t t should cert nls be q est n d I i te je rs ther has been a good many surgeon who



the ize of the tho accc ge at s chat m notb fb ett

It ha been erf var c th jat nt a ptdugiadh vthtvi y lag If only ubjet diffculty that f h idly up a step hill thr i ome h t s flr th ad heez g The ern cid c fr She 1 abl to cary ut hrh metasta adh dutes as tel phon pe at r tho t prat y mla assment She hada maldel erv adpepium Apilio44 Thefteal ca t liwhether the lugti su in the a B entually b kdo beca frupt of the lat t uc f moverstra Aga t this publity till t t gt not that the fat ent vital capa ty and ability to cary othr lav ctati hve m po ed pog css elv th four y rs foll ng or CR LSBIR V MD

Nel on W. E. and Smith L. W. G. n. 1 d. Ob tru ti Emphy main 1 fants J J d t S Lo s 1945 6 36

Acut and h n r rat y d tu b c s n h ch the cha ct tic l ical man l st t an explatory type I dyp a a s c ted t thg er I demphy in ar not common in the 1 rst l ar of life The til vast consd ble et nt The spat ry bt ct: is p p lly in the d tal o mall r b ch l Th a rul obstructi to both pat on a d pat n but the difficulty; pt n them errm t diris trapped n th all oh a d p d m physema Th em kda tn the d gr of bet ction a ll s i the t ol th obst et gless s that ot lyd th dg c of emphys may but n tham cethrirequintly ara of telectiss swill my 1 mphy sem Atel cta s tu ally f ll w th mphy ma h nob truct nis on plet nd the tr p dal la airb sbe abs bd

Cases f bstr ct emphys ma h l calleatur i ommon Th e s d re pir t ry ate a d ma k dly d re s d D t s xcus s s cuated th util atin ith cc solitusch fr praton Inc nt att lev g al obst tion the c s u ally n hoars r st drad noit tt sthma fq tly aud hl wh g Cy no d p ds 1 n tl 3 gre of the ob tr cti Th p u i nt cpt o er local i a ex sold thad the r praty muma h ten I by a p long tion a d s lly r of the ptryphac Thmym
nn mediu rales O the tg m
d thr gm n to be! a d flatt d th t b m th the apart thus lait this still define any the tage that as folding to the assignment of the apart thus may the tage that as folding to the tage that a still the assignment of at lecta Onfluspthrist 1 1 1

e cursin ithel diltt ld i hragm In the thors preth to la late

st rba frfmum h I th

mai its I the inf nts bery d hav had an ac te If I m ted co se u aff ted by the ulf am de 1 stro gly su st cof b ng the i f ntil coun

tro t f nflu al (v rus) pneumonits or of so called p imary atypical o rlp eumonia the ha been a va ty f patbologic I condit ons which hav been r 1 on ble fo dy pnea in associat on ith

Case h store s all strating c nd tions in which obstructive emphysem i an important featu e a e pr ent d Th ci lud asp tion of l rg amount of am lot c flu d and it co tent du in or just prior t del ery resp atory i fections sociated with cystic for sof the pan eas cute bron hil ti (int rst t I pn umonia) atypical fo ms of acute t acheobro ch tr a piration of z este rate po der and ch onic pass we conge to n secondary to a c n g nital ca diac les on In the fatal ase the gros and m c oscopic exam nat on of the lun a e de semb d

Whe large q nttes of am to fluid and its c ntents a e a pirated i to the l ng bronchoscop c asp tinwil be helpful n cl rigth tr chea and larger bro chi or i t at cheal a pir ti n by means ol a cath terp ss d through a lary g c pe may b pel able O 1g n with ca bon di de added each hut c nt cith dry ng ffect of the oxygen : n ed d In c se of acut lary botra h obronchit s bo ho copc ttrta heal a pirat n is i cat d Th major ty finfant i thacut bronch lit show lack of l atle r sp nse t the sul to am d I NE E AR

Rob t J E Il Tubb O S nd B te M Pi ural a d Pulmonary Suppu ati n Tr t d with P nicillin L et L d 945 48 39

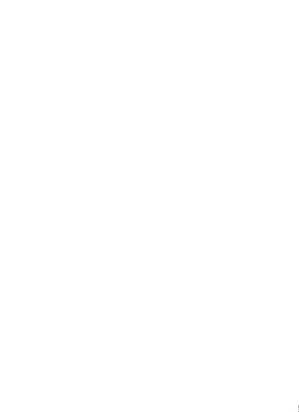
P nicll nappe s to lowe the ned e of 1 fe tini cases of ta matchemoth a ac ord ne with the find sof the nvestig tir

The case of cut troop n mp; n trat dically the penelli Stitto is usually btid adl; but a pato and itapl rl i ject nofp cilla i e e lt s mu h pl ural thick ig that op rat et im tis r qui d'a na thek pusirms E uati fllabrin nd subsequet lifthe oudmypvst factors in s me ca s but the m t un formly good e ults ill p ob bly be obtan d by tr 1 age Int a plual; clin ill clea ly pl 3 its mo t impo ta it ol c ses d g o dat early stag who the fid setll then and loc late has a t cour d

The ples pate laly to these cas fetr pto c cal gn that all cive p o ic oce est clly nchld th ag d Intra leu al pe clini av labl ag tinerad cating c days fecto f m tuber ulou pl ut l

Other I cal c ll ct ns of 1 1 the hast g mplicating the rac pla ty m y be perma thy st lized hy pen cilin

The structed not ton fill in cases f I lm nary s pp rat qu s muh f th r



sential a d wheneve possible a fluoroscopic exam tion should be made lso

The authors r po t 3 c ses of their own which they desc be in d t il and flustrate with se eral roent enograms. Since June 1944 and hefore the ticle went to p ss they observed 3 add t nat case. In all cases a tific all pratton had been used and this may have pl yed ap at in the production of the picture medicat. In it essed b we to be a second by the production of the picture medicat. In it is essed b we have to be a second by the picture of the pictur

A bibl ography f 26 art cl is appe d d T L vcvri M D

#### MISCELLANEOUS

Vn Bahr V G Embolism Origin ti g in th P lm n y V ins Up I lak for f h 944 49 59

Its met me happe n thec cof a ple alor go at us generation such as dra go ad us given of pleu al emily me the apetic per mothor at a divider a consistency of the action of the large that the puent shows symptoms emily the large that the puent tacks may be of various type. Set the consistency of th

The attacks have b nk na pl l h ck lple al clampsis The pr g need f m d th acc ug ryr ders thighly d h u heth pleural sh k c be pod c d man the gh mech cal tatt nof the pa t l ple a no the other had cf i the f m f dek my l d need to be shall be not be shall be not be shall be not be not dearly d trib ces h h my l d need to be not be not

The uthor ep ts o more less din te ca es frembol m collected form 10 us hopt I Sweden dh da sthef llog coclo
Pulmo ayembol m y a e the pulmo v

Ne ns 1 c n ect on the pret cally e e v lorm f r lat ely f eque tly ect n 1th tüil P umoth axeither b cas ir s j cted d tly into a ve or the ar n th p eum th ca ty enters injur d v in Sinc g t p es e ofte pre als in the pulmo a y arca b ck d nto them is easily not not the first the larger of the larger of the larger of the first tendent of the larger of On the basis f pe im ts on rabb ts the a tho I u d that the a gepess ein th I ft entrele duing i pir t n as er th n the atmospher pesu egadles f the post of the a mal The ape m nts al or deat d that th pes u th p et f th p lm ay bo th le l f the hart a d th t th refo e ar mbol m was more I kely to a i e f the lesion was ituated high pin rel tion to the heat

As j dged fr m etp imental and clinical experie oc the ste of the ir mbol in the system oci cu lat on shighly dep ndent in the posit in of the body hen the emb lism develops. The dag ous symptoms a e cau ed by emboli in the cotonary creula tion f the heart a d in the cotonary creula per iments on cadav p cumes th autho fo

ther k of mh lsm these ess is to be laten the pupout on with the headely ted bout 30 d gres in that putone he ly all the infollow! It hill od team thrugh the a taad only vey small mounts of t pased to the corory and cartidly ell.

The 1d s not pass thrugh the d a yep! lare in the system cac lation but nly throgh r lat v ly de arte iov n us anastomos S. Most f the ai s horbed f in the p capillary v seels and thus d n treach the veous part of the cir laton. The absorpt noccurs within an hur o s B caus of cing lu ation of the cir pulces thin terrupt on of the circulation may continue evin after the air h herab orbed.

The d cal pet responsally domated either by the fall e by signs of cer hall irrat a nor dysfunct o Outly thing gament and the pet signs of cer hall irrat a nor case on the toger estimated and the fall of the fa

In der tor duce ther k of mbol m n n n g ton of n empyeme cavity pr v ion must be mad fr th fe escap of the arand at heade the tuh 51 ge d fo irrigat n The pat the did he st h it the rigated cast the blow the le lof the heart P net est the pulmo aryp r e chym should a lo be made below the level of the

h t II blood is secured a time below the lyel of the h till blood is secured a the synnge a pneum nites att la ger u t extract the needle b for the p te t has he pl c lso a to br g the site of the lesion bel with h art

The u e of the the mocautery te d fakn fe t m ke th man in reduces the rik of a mboh m. The thermocautery hould be fintly gloung

Pos tu pressure respr to peets a embo h m from outs d a but d es ot peve t its d clopm nt as a result of a b o chove ous omm n cat n p oduc d for e ample by pu cture th ugh

the pulmonary pare chyma.

The treatment of air emboh in should first be directed at the per union of the firmation of new emh h hartificial respiration can then b given if not t d O year gay respiration.

of the discreparation can then be given if add to the discreparation than and he at to ies pob bly ha a fa able if ct by facil tat g the absorption of the a mb h. It is unc. tan wheth card ac a collar in the pag of the rith og h the narrow essel of the properation when the



## SURGERY OF THE ABDOMEN

#### ABDOMINAL WALL AND PERITONEUM

Daniel R A Jr and H Ib ook T J Th Pr tl n of Staphylococ us Inf ct on of th P rl

m S g y 945 7 39 Because of the diffic lities if evaluating the effect ol bacte iostat cag nts h ch ar mplant d in c n

tame ated you do a d hec se org nisms tro duc d: tow nds of the kin and subcuta coust 1 t oduced th ough needl nto the sub us tis es give es towd ly vary glesi ns nd ffe ent nimal D jelad Hilbook h leved that the p oblem c llb studed to ad a t ge hy c eat ng ge ral z d and mostly lethal fects ns of the scouse tes of nim is As niee t pen ments h re n the local effect f sulfa I made fath le a d sullad a 1 e upo th p event n of i fect n f th pleu l caviti s of d gs following eo t m tion with the hemolytic staphy lo occus u us thes inv t gat impla t d th sam rga sm thath perit elea t sofd g a d 1 tr duc d hacter ostatic age t immed at ly th eaft r

In dogs which var dwd ly in eight tho me tum wa complitely depr d f ts hl d pply a d sup as on f h molyte st phylocus a 1 e n orm is h e solut o wa njected mong

the lops of test e Wh a drug was u dit a 1 troduc d mm hat ly after the orga sms w

1 ] eted The fits f sulfonam des in p events g f t i staphyloc ceus ure s p ito tis n dog ted s ipr se i smuch as sulf this ole w s les ffecti e than sulia ilamide o sulfadiaz ne Th call) opp ed to the find; gs n empyema of dogs

Total g ne lized pe iton tis occurr d most fr quatly 1 th gop of a mais treat d with sulfa tha ole a d least fr q e tly in thos tre ted with sulf ilam de The low st m t l ty ate 1 a y group me ver oc rrd in nimal tetd by fs lfa lamd g n by m utb to local application f the drug

S EPREN 1 ZIEMAN M D

#### GASTROINTESTINAL TRACT

Vid b k A Solit ry nd Multipl Ca cln m Uppe Allmentary Tra t 11 Stockh 944 5 339

I the t el e years fo 1 93 t 942 th r w e en and treated at th Rad m C nte 1 C pe hagen 133 pat t theac f the ppr l ments ) tr ct that fill lps th m co m m br cof the rlea to dth t gu th t largn th mes ph n lhps harn the phgu cldgth cada I this co t n the mesophary nx nd h por h rs are nd r stood compring the ba fith tongue the p

gl tti (both ts ventr la dd als rfa e and its f ee m g ) th epiglott c valleculae the aryen glottic ill the priform ecesses and the a vt noid and poste scool regs n h ides the late land po te ior walls if the m sopharyn and hypoph ryn

The s to of these cancers thus comp ises a reg n e te ding f om the apertu e f the mouth to and mel d g th card a a eg n which phy jolog cally may he con id ed as a while since the cavities ch efly s ve for the passag of the f od particl s be they es hy cted in the stom ch to le gthyp c of digestion They a at m cally pr sent un fo m ty msofar as that th mucous mem br e tho gho t co si ts of e e al layers of a nonk at 121 gsq am u e llepith hum The only e cepti nt this a e thelp hich are co er d with a mod fied mucou memb a e and s high p haps d not st ctly speaking form p t f the alimentary t act Th rea n fo clud ng th m 1 the fild f the invest gat on s the s milarity of truct e of ca cin mas f the l p and ca c n mas of the o al cavity

A ve of the mate ial h ws that th m tf q ent it f cance f th upper I ment v tract n the st te se se s th es Thagus C near of th esophagus s th ee to four times a frequent in men as in women In hoth s es the leation i n th

t athoracie portion : ah ut 85 pe e nt of the cases In the c rucal p t n f the esophagus th e a cha acte stie diffe ence n r ga d to the occur ee of ca cer n the two se s In omen th tum s most fr qu ntly it ated at the nt a ce to or in

then ekp rt f the tube 1 men th locat on 18 pr d mn tely in the ; gulum

In w men the t m rs ecu chi fly in the post e i id eg th poste for a ll of the phar nx the ent neet the sph gu and the cerveal p to of the l ttc m men th ; occur mostly in the lowe I p the base of the t ngue the puriform s nus and the part of the esophagus f mand include g the jugulum d vn to the hifu cat on In other reg ons th e s no d monst abl dff re c in the relative f eq ency of the tumor in the two sexes

M cro c pically the tum is are of d flerent types No col th mis rel t ely m re frequent in o es x than in th other The diff enc depe ds o ly n

the locat on of the gr wth

According t both cl ical and e perimental e pe ri ce t eem pr h ble that th d e cours as the es lt fac mh edacto of it l fact rs - the p d poston-add rs gen usfet rs-such as t lacco ale hol lues de tal car es liveol r pi nd I dly fit g de tal p osth ses In the uth smat allues was rat ul ly f que t n the an imness of pate t with lp ca er (95 pe

nt) a d carcin m f th t ngu (2 8 p ce t) Hes f q t in th a am esis f pate ts with c e ma f th h poph ry nx and of the esophagu. t in th a am esis f pate ts with



p i nal fistulas o absc sses a soc at d w th d a rhea abdominal distention vague lo er abdominal pain or u e plained feve. There my b chonic or 1 te mittent d'arrhea associated th' abdominal pain of the peristaltic type. The e may be dull to moderately s ve e low bdom al pain ass ci ted with darrh a be be ygmus with r vitbout a palpable mass or a l w grad feve F nally there may be symptoms of ch onic rec ent or acute intestinal obstruct on

Roe ig fi d gs An e p rtly pe formed ba um meal study of the mall nt stine t geth r with a barium enema ill u ally lead t the corr ct di g coss This sho ld be dine in the cases of all pa te is except the e who have definit bitruc ton or thos with sympt ms imulating cute ap-In the p esence of a ch onic c cat 1 g les n f the roc tg n v t gat on s n g ti e th xam at o has u ually be n dequat r the int rp tat on in err r Al sion incapabl f how ing some type of centg n def ct f the intest e i h rdly o e wh cb wo ld req ire l par t my

There is co sid rable c ni oversy n the eti l gv W do not know heth the ausative ag t s n orga m a v ru r an an mal paras t The p

orga mavru ran an mal paras t organ a vru ran an mai parast like p mary att ck f the unkn wn et l g cal ge t may be by ay f th 1 t stm of though the blood stram but the lymphat c st cturs u ques to ably voled alvad at siely Bf e ther 1 a cell lar filtr tion of the tis es th s b muco a sho s pr ounc d th ke mg du t lympb d hyperplas a a d obstuctiv 1 mpbedema I'm lymph nodes exhibit the am ch ges b t the t nt of muc l lee at n is not al vs p po at t th inv lvem t of the lymph t cs

The ather had optitisen him goal the apy was used blen I then hid term all It 3 had rg al leitis (not t mn l) a d 5 had le olti ku f these p tents d da d 5 su 1 ed In th 15 s rv or th e v 9

re ces o good rult er obt ned 37 pr Wh the surgical ults ar compar d is lts f ll 1 g oth the ap tic pr d th th the c d n may b each d that 3 f th p t nts no ldh e succumbed w thout u g rs as mp r d

th the d ath f 4 foll 1 g operat 1 7 ther cases t is most alkely th t mo e fa rabl uld have b btad then ret agmet nie of the tet fthi nd th pres c f fi tulas nd the ab milte Casqethly nyct ia ofth opat ats would ctalh be bit fihd urg y not b nd e Thi lea es o pat ts hom the res lis to b a topat dla co rat m tea th est mat d But t do btf l f ll opt nts oldhare mid willas 7 fthem ebe fil gresect of th less I o der t d cid th question fth I blt of rad cal surg ry to c e at m

at m gmet n th bs c of compl t h th ntth ch 22 Im to roces th te-t 1 tl t 1

mesentery ever recede duri g the course of adequate med cal ma agement. It is possible in some i st nces that rec s ion of the I sion may occur but

up sence ith the di ease up t this time would ugg st that complet esolution r rely takes place Hovev r even though operation is deemed impo s ble adeq te medical management should be c n tinued indefinitely as clinical improvement in an ccasso al pat nt may be nothin less than r mark abl follo ng a relatively short period of ho p taliza tion a d thoro ghly adequate mana ement

SAMUEL J FOG ISON M D

Frimann Dahl J On Strangulating Ob truct in of the Small Boy 1 with Spe lai R f renee t with P r Roentg n Finding ad 1 St kh 944 5 48

Mo ta tho sagr that the oe tgen examination f n sbes valuabl inf mat n as to the type file location of the obst uct in a d in may cases evin

tb ch act r of the sten sis

F practical purposes tw kinds of ile s may be d stanguish d ( ) s mple betruct on f the bow ! by adhes us pess ef om outs de or a pathologi cal process ith n the gut and ( ) st angulati g il u u ually cau d by ba ds wh ch f eq ently con tret two segm ts of intestine A st angulati g il us is usually caused by bands co trict g tv segm ats f the gut the carceration of a pa t f the mes attery. True trangulate as nearly always i vol e only th sm ll int to Th sit of the ob tr ction lies most feq ently 1 th lo er il um and n equ tly th bstructio i u ually locat I in the right lo e pat f the abd men A simpl obstruction dev lops rel to ly slowly with leik attacks whil tra gulat n dev lops ou ker th p ins e mo v le t and mor c stant and th p te tis mo e zhausted In the first the testinal mov m ts a e dist cti e in the latt r th per tli bas be ed cd h s complet ly cea d th e tre pictu pont to ard pe it n ts

The questio a uses wh th r b th types of ile can b d t gu bed ro tg n l gically T answer th quest the uth rev wed 28 cas of m chan cal il s \mo g them we e 32 cases of stran gulat a d f these 2 gave inconcl iv or poo x rav fi d gs Th fa lure t vis aliz clear gas nd fl dl els in thes ca\_es m > ha been d t the fact that the p te ts ts allo ng air Also gas was p bahl) not enter g the p estenos s ect on becau of p e of th gut finally an ntiperi taltie mo eme t could ha repell d the gas In pate is vib an acut bd m nal cod to n

whom x as f I t demon t at clear gas nd flu l l els the f llo i g f dings just fy su picion f tr ngulati n il u (a) an bn mally mall am nt f gas n the col du t th fact that the ntest nes d tal f th t noss a shru k n nd co tr cted (b) a tum isk h i wu ially n th right lower abd me f re g c cula in sh pe nd well c cum cr bed but with ut th b rp pe iph len tri actal(c)pelc udt



f th

f th ln r ben ath I ve f th se n n had ab crosses in the abd minal w ll ith pat al r c m plt egarator f th abd n lle n Two develop d subphren c al scesses (b lat al) se and r pat in present d an cerati The pera twe notes occ stonally mentin d the fact that ten son was crossay to ct rours th he!

I the f t place mobil zat on f th la ge b w l by divi on fits lat lprt n lattachm nts is a elatively avasc large c du c Th only bl dv s s is which my need to be climped a divided are af at the spl nic and hepatic il xu es Th retro pe ito al s co d portion of the du denum will be no nterd the right ad nisl ldh care fully r flect d p t 1 rly Th te n the side nv l ed hould of c urse b fou d d pr served An ex lient guid to th urete the pe matic v slcrstgante to thucterd thy bel the kid y plvis and hy gjust lt alt thugh otits corsed thepl I t laton the jejun m t the g ment of the ple c fle Tr tz ill ofte be posdadijnyt tshild b avoid d Th m nte y of th lon llb me r th r thi nd d licate as it effect d f om the potrabd m nal w llad em tb tak nl t it be performed by the retact g fingers A performed shill of course b clo d to 1 v t possible h m at on of the sm ll b el th sh the sary lb at on f th gmod ol
amont of d s ct on c ss y th would lly nec The tra v se 1 dep da l gely nats du 1 cy The me turm has na c! attahm t t th tas rs c to nd ca b th mo d L n th nc ary b at of both fi ure hold not prolog th op at p d r und by 1 m t cases a d th the d q teepoure that i cs n tal n the cp tint i hold add but fi t n m nutes to the p tig tim

b lp mt th rapd format of fost mhd ull brilded is my spr Thu tu mak t fibt to timt t t to tat a later de by retar to lope dur. Tworvof sut cunt the tolope for the tesubs que telepart to the tesubs que to the tesubs que to the tesubs que to the telepart to the tesubs que to the tesu

I the c dpl ce ad q t mobili at

usu th tme f closur so that it can be n ve ff ith it ten N c mpl cat ons occur ed which it it is no me can be come of the clamping closur a diture has be no mortally among the patints vith privated colons. On patient had leakage of it esti al foon it postoperatively it is as prob bly de to the combinition of a short sport plus the first in of an abscess postopera tively in the old sinustic activation of the color of t

The 1 denc of nection n the e ouds was high heau they we open toud in the col freque thy a social of the goss soil ig of the per stone I cavity by feal in it all Recause of this fet is me su ge shel we that omplete closure of the 1 pa otomy inc sion with eat 1 at nof the bowel through a late al stab wou did creases the 1 cidenc of fet on and separatio. In the original cisions was equal to ge can like go can't be go with the color to make equal to go the color to make equal to go the color to make the color to m

The tremendous munt is support we teatment nee sary to carry the sep tents we reach of their mplications has not been mint ned but can ady be more get. The tech calt eatment of may if this complication is usually nited field by the day in softene ceedingly off cult. The pat into have all benith ugh so much that their mag no is fet; is small a done mit be constantly in the alect of the ceeding the first may not set to the set of the set

KysEL J Th Sn tln f Ga Stopp ge d tlg th O t of A ut Appe d citis S f 7 945 7 7

Most sug ns mp act codely the disgnoss facute peede ct until the pan local zes and be cau of this the ppe dix my perfor to be for in the believes that an accur the beautiful suggestion of going the disgnossing the suggestion of pincare and be as a dome this gas stopping so shart on The onset fappend citis mea is the first hours of

vague bd minal d's mi t pio to leal zat n us lis co ider d't be d'e to v distent n'itb ppendu It ia austauned colie vinhe a seldom be sh ph located but s'r f'red to the ce t'roft he abd m unble u reg gest m It a less fom a u be abl ache t a feeling of nagg ng d m oft oft as oct t w than sea or v mit g It somet mest uppor ris ri ved by the passag of ga

The n ton igas st ppag al ) a des t pas gas down a d r ther than ur a dit ha c t n t call r l ed l til f a t all by wh t ga es feces which I tiv thou by city en t n (a



f ms of drainage of the jerito m and abd m 1 wall wer b ndo id Thr as n proceptible change in the number of nt abdom nal b cc ses or in generali ed pe toutits. The w of s lk suits material reduce of the number of in all iffect n apprecably. Wounds cl sed with silk h ch b came in feted drained app to imately 5 p ce t 1 n than unlar infected o ds 1 h ch c tgut was is d

By 1912 th techn qu hich had volv d at the clu mployed th MeII y mean in dr n age the use of silk (nylom ret ny) seture ma trail a d the u of sulfo a med dr gs. The the in the last 300 case have bee most satisfacto y fint in the renal lably! I motaly 1 g.p. rent) and soond in the ed etto. It is number and seven try of indext us comple to nos. The wild so the document of the control of the document of the control of the con

TOR L L DO ND

#### LIVER GALL BLADDER PANCREAS AND SPLEEN

Ba hhuber C A D b P II and f yl r F A Gangren a d P f atl n f th Gall Bl dd Am J S g 945 67 4

In are wofth litriu o the galtet me tofgall bladd ls two foods that two cust lead rep ts advected ameter eally pp 1 typs of therapy Smily the fracal pp 1 pr nited s g dish different type for this gest of section of the section of t

In the prod b twe all nuary of a d Ja D 1 104 do path at e dmitt dt the I lagel a Conty (eneral II pt I dung a act attack of bil ry treated ese role etwes g y foll wight absd c fth d a. Eight hu dred a d ntv fepat t ottr tid g culls a d s fthe ed d am tilty f s per

Of th tall ub fpt t dmttdt the hoptal 115 (6) fp c t) wref dt b f let g fom spef lorh ldulcratt 34 (pe ent) from a gree c (858 p c ct) it mit nal bit ry fat l 8 (t sper t) if m pe chol yttle ab ces form too and 45 (6 pc t) lom fe perforatio with tot lied c is 36 Petcent of some type fance gas ge

When the ulceratine gopwa metted the colone of ganger neady rife to training the total number of cass as 56° pt. The rive of this ong the pt. if it mit to blary f tulas gangene pe holeyste bee

ir p foratio on the med cal serv ce and 9 opera the and 8 n n per tive de this on the surge 1 s ru e a total of 47 deaths or a over all mo tal tyo 276pc ce 1 Of thessed at his 38 n c n perati this gr p made mp 8 85 p cent if th t 1 mor tail ty a d placed th surge al mortal ty at 53 pc cent and the m d cal mot all ty at 23 p cent.

The comparati incide ce fg ngre and p fo atom app s rathen his but the nearly so hg' some of the statistics quoted from the lt aturn II flar is in der t chiefe cet conclusions the number of acute at the seach patient in the ser exper need hould be hown to dit min correctly his celle ce of gang or pitation in the service of the service

deaths from the ga gr nou gr up repre ent in r
tal ty which must be c dered

of mo tail ty from h l'ny tract d'sease sith on per at eor th forgitten go p a group bout; h h little shea d Ma while the points lith d'i ferent types fithe py y nd the tue of m m date early a d hat gall bladders g ry lith adher is it h d'if et typ of the py woulf p us hit m ment d gi thig up th [r per con derato sub ts it duction in him tail ty i'd softh bid y tract co lid be obt 1 } Ih pr pr tueat i the public the rightly the first me cls n spors ble will undoubt dly st viffs me fith ar scompleation at a later date ad h a mark d on inhout on to rid h l wer go of this mo tail ty Thim e recurr t attacks the part of has the more likely it s that h may be uffing als f m som s to soon om tant dis s. I from advac g ag all of whih

By f r lhe m timpo to tgr pin the r duct on

c t butel th m talt;
l c du the uthers ble e that the da get
f g ngr ne nd p f tons erst s l by th
gr up th tf rs m edat su ge; Cre trat
t ntu ash kdb p du the lorgo titen gr up th tro

thin shild by diotheforgoitengr up through
presered cat hich will big the path it
suffers tale all g the delay nearly
suffers ills rethe pate twhos kshop tal
thanks smothered.

J E KIRKP TR CK VI D

### MISCELLANEOUS

M Ls M nd Freedl nd r S O Spont ne u Intra and min 1 H m rrh ge A S t

H morth ge with n the abd men d int the per ton al cavity s t n t li ncomm n ll w w wh n clude bled ng f g talon n



## GYNECOLOGY

#### UTERUS

Randall C I Recuniton d M nag m nt of th W m n P d p d to Ut n Aden rcin ma J im M d A 945 7

The most pact cal ba fr eco ton f th wm np disp selto de cim fth ut r s ug tel by data off din s p rt of the f ll w gc cl )

Th c r fi casdoir la hl d dig the I mact ic p t per I by nly 13 wome amog a h ro & g th ough the chang of If

The icd c of the de el pme t of de cacnom pior to the mc paued m d d quate nve t at on a d t eatme t wh e malbled ng cur n w me

postm pausal bleed g c m tha hist ry of me o h gad ng the clm cteri ha a th e 1 half t mes gr t ch nc f ha 1 g dev loped neer th d's the mnwh mp iccd crafblit t the c ssatio fh [ ]

I the p nt t te f k l is r d g
th et l is feach m f recfee mm la
to sea be mad as f a p phylet refr k ligrdg a e co er 1 Dagnot c ttag t th / t ir gula ity f bl dng he wmnct t men trat aft fifty s f ge cmm l l When pelvel pot my sock df w ma patth hidb ing thuldbe m b d
th tert nly hy ter tomy ndp b bly bl t t
o pho ctomy llpr e t the s beeg td lor m tof d noca c ma the fu d's Alth gh to eff ctive ess has ot b n onv nei glv ho vn castrat by read t is d ble h m nstrual g lart s d cat ad g st t ged r ng the cl mact y rs

leed ring the climact yrs

I he there stool titleg eraic gnt fa

I dime tal lelly debyti ary; the dip

mut fin comm fithe trus it see

s, able that we we tually re ogn z chalat tes f the ndiv dual most likely to de I p a pecte type f ca c W th ade oca ci m f th t u n m d h n postmenopau l bl d g thre is rason t v w th gre t sup th se om n h have e per celi dom i m h t fl shes d hose vul ar d ag l tis suggest cont nu d stroge act vity Th bl f

is b sed o the c ict n th t th w ma b estroge c timul tin tp tth m p se Il ntilpthe lt ( 13 MI

TIVI of Vg I Samusintl D k si f E ly Malig 1 J Ob # 45 49 59 Th m th 1 f bt simple Th eq ipm nt cess f g th ch pra

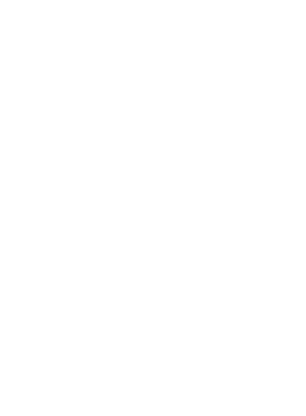


t n consi ts f lightly curv d glass [ rett to h his it chd small ubbrs ction t be to micocp Ids eah quipped tha paper di a d f at (am ture i eq al pa ts i 95 per c tethylatchol d th)

The maitake b fo anyex minglineat use! The lab a e epar t 1 nd th pip tt s int d edhghi to the v g nal v ult th the bull comp ess d 1 the pp tt is withdr in th bull then sl wly ! rapressed The mat alth ob t ed then p vedo th u fac f the sl le a d f de e ly Them t lides ar immed t ly mmers di the fix ng l to wh they may c m n f r n i d finte pe iod. Th v g nal p ads r t ed th by Papan c l us method r by a mod heat n fit

el nsacha d po 427 cases I o cae algos fmlg c am!fmth glnar fhhs wrechfmll th mal 531 tee feat mafth funl 3 a lof a coma fth c 11 ca. C fm ton fthe gnalsmead gos

bt 1th ght ue tudy 111 to in t n s I 7 ca es a n g ti m r diagnosis was



peated se al citement tumo of the pelvi and had ork reque g much lit g valling or

stand g

S condary changes in the o a i s may occ b cause f th chr c cong stro Th y may bec m cyst c and may be ass cat d 1 1th me or b gia and later th v may become fibr t c d underg scle otic changes r s lting 1 a d creas d menstru I flow 1s a esult of chr pass e c g stion bype t opby of the endom trium and fibr ss fth uterine wall may

The panis de bdas ad Il ach i the pel orse he th pate t is stand a d r het d when she s recumb nt Th may be als m o rhag lysp reu 12 e k ess ne

che lu rhea nd dysme rhea The co rect day my be mad by ly ang the pat ents ympt m and fr m th p lych d g Onplic am atio n myfidblat raladne al te der swtbs ft doughy re st c non orb th adne b to thout the p nee fa defi t mas The dughyr stanthe adam y b more maked if the pate tise am linth Folerp t no wh nata dng Th sympt m and ds blity f th patient are t of pr p t on to hat ould pect to fi d on pel c am at

The author peents a e fh an ly as s at the Los Agl Cuty Hottl Lo Agls Calfor a Them tomm n vmpt m wr menor bgandpa While the t atm t) not all ay sat f ctry lff the pt nt is bt i df om pes f th t us > f om his ter ctomy If the diti nilateral tomy of the aff ct d ie a d ubt tal hy t ill gie a b tte ult th n by t tomy lon Sup ns on f the teru p rf rn ed p | ly lways mprov stl c dto ev nth ghth ult is t all that mybd red

F Tru M D

M tn D G P lvi Lymphad n t my in th Tre tm t of Cervical Cancer 4m J Obs 945 49 9

If the prims | hchTugbsdbsopr at o nan ely, that m tastases lymph des ar pecularly resistant t rad t n ca be substa tated thin his pood dives a much more e tend 1 tr 1 If how v r t ca be shown that m d m x ad ti may ctually dest ov m tast te can e n lymph n des th n ths p t and poss bly mr comprhe meth d my poe pe r Th n mb of cas s so far s by t d to th proced e of lymphadene t my is insufficent to d true edit it livits phe f sful essible treatm t fer recalege ee. The dist thy lowe in edence f gla luiri olem nt the uthors nce f gla lul r t ol em nt th uthors
s when the operat o w s carried t after x

radiat n s ggests th t mod rn roentgen techniques 13) m ke lymph de ectomy es rv Čer f peri t Is the lt ellfra te i ca ubjet dit pre pirative radat n c 1 1 tl th white respect

rad at on has been employed as the appears to be the cru of the wb le matter

The actual five y a esults in this goup of 8 cases a e of I tile s gnificance in ev luati g this pro edure as a meth d of tr tment It is of ntere t that the 1 s of at least 3 men from whom gland in olv d by cancer we e removed we e appar ntly s ved by the pr cedure Of th r pat ents in the five year gro p in whom the gland vere nvol d only as rvived whil of 18 pat ents in whom glandu lar myolv ment w s n t f und 6 survived the five year p nod While these fig ess mt point a very om nous finger at gland lar invol ment t lea t 5 of the o deaths were due to the local c ryical rec re ce and invas n of cancer and n t to the extenc of ca cer 1 the gl nds

I DWARD L C M D

#### MISCELLANEOUS

d S C The T atm nt of Pr m nstrual Dis te with Speci I C n id rati n of th And g ns J Am M A 945 7 377

Relatively littl attenti n ba bee p 11 by m st physica to the dist ess that meny omen undergoduring the pomentru lipe od hich usually d appears thath o tof men s Th d turbanc at the time f the ova a cycle habe termed p menstr al tensi n Th sympt ms a si g a sed character and in ntens ty an l cur i

v oscmb to the mote mm nemplats be gnervous ss t blty depre o moti al instability h dache naus a and a feeling of tense e The most c mm sig s a bl at g f th abdom na 1 beut n us d m

Gr nhlla d Fr dm int med th t the rete ti n

is dum by the t ssu s duc d by the se st r ds operating d ing th p m istrual phase sr p ns ble This r t nt n is dium is sociated with an c as n tra li l r flu d so that th s vell ng f th varou t ue g s ri to the respe ti symptoms

TABLE I -TREATMENT OF PREMENSTRUAL DISTRESS WITH TESTOSTEROVE PROPIONATE

N mbe f	Number { Tre so to	Sev y (S)mpoma	
		Bel re Tre tm	AI T m
	3	4 +	3 +
		111	1 + 5 - 4
5		++++	1-1-1-



### OBSTETRICS

#### PREGNANCY AND ITS COMPLICATIONS

Arn II R F A TI putl Reimnf Eclmpia 1 J Ob t 945 49 49

Tire i f ted i th art cl plan f man a eme t of clam a th r ult f h ch n m tern I d ath corred in 42 pro ally p vised caes Sofar cablt nadth sthelgst succes ful 1 t l r ded

The therag to in outlinding theran rorg l but to bl v l that the dt l of t applicatina ntlav dt thth cc wth hichthy er april 1 thisse u cmitt ca car ttrl t lth esses heh ere ach cv d

Thopla; bael (a) a lt ac cept f m nag me t n h ch th d ngers f b th o crt eatm tad nl m t t catm t

uat J (b) const nt ( th most lt l nse f the d) ob er tin feach cl mrte pat nt by expeed taff thr h t thet cucf the value of the price of the value of the v

cha ge of postur plus the f yg th py and of a prat on du g th t ph f th d and of a prat on du g th t ph f th d ta (b) lim tation f sedat t th l age c sary to cont ol co l s nl hyp rt bl tv (c) I m tat n f d to e therapy to the mill t am utnessry t nsu as t fat y ay output the ret t al fl ds m mum amou t as s n a the s ll ng fl (d) d lay ( labor ( nle te ue po tan 15) utith pt mum co y fom the cute tag h st k n place () ict of l bo at the pt mum time nd by th s mpl st method med cal in d ett n b g p ted f th fret ttempt a suesfl (i) Im tat n fope at e tert the relucbl m m m n1(g) the  $\mathbf{f} \mathbf{1} = \mathbf{1}$ 

analy sia f all f m of p at w L the the pat nt lutu health rth seq ntp gna c ar in a y a jopal db th s plan of ma ag me t The st t t ba d upon ob er ti f (a) 85 p t ts t t al f lrom f v t tvel c k aft del r. (b) f 40 e k aft del r. (b) f 46 patents at 1 ters I of f m to t v rs fter del ery a d (c) of 34 p tie t so bo t regnances The cd ne of res d in the introurr t grup f pat t thin th

hole group f ll | pa | as m || th a | some of the subs, ut

Ad qut lerato fth I I II hel d ded i fet l 1 & th ut f th mat m lr L Ti ftalft li tl 4 ttov is he the plf et tl î t frth hild was ner s giv appl d

La Lofaf q at p phyl a thef et rehiefly spo ble fo th d l f me t of eclamps a in thes 14 cases I th pect al q ate care duri ges t ffci t I tell nt c e a d sound ıdışmıt alone leldiri lbratdeliy v and thou h ut th pu rper um

A L C

Hbr CP TI Tal f ti C n vative tm tof E lamps a A J Ob! 045 40

gth fucy ar pen dfr m Ja uarv 1038 t December 3 1943 the ev c 6 994 pat ts d f ver din th Will m H C lema H sp t I Indi na U vrsty M d cal Center I d napol Th e

e 5 cl mpt pat nts dur g this time Th ep ent agos cilence f 7 p ch reo de

lv ies

Th ty s ve of the patients c e dmitted t the hop tal as emerg note and had n t b n c n p vi ly by tl staff The staff accepts r p ns bil ty fo th de clopme t of clamps a in the em ig 14 pt nts n incd nc of 21 ach

d hve es

Eci mp a aspea d dur g very month f tle year but J u y Th ty sprent fth lamp to pat nts h w v v e en dur g the months of May d Ju Only 9 of th 51 p t nt had had mo tha on prevos delivery and 35 eep eg n t for the f t tm Eghty four per ce t of th nat nts er under thirty ye is of ale

In th t tise ses ther we m t hald aths a 1 sof 3 s per cent of the pat nts The c wer als 8 f tal a 1 o atal deaths n nfant m rtal ty f 35 p c t These esults are s p or that a furtler

nalyss fth m sampe t c

Of th 14 p t nts who d velop 1 cl mps aft r ec vi gpr natale e 8 d v lop d th ir in tial con vul on postp tt m nd non h d m re th n 3 co los Thre a mints suvi d The r fetal de th as a st libo n pr matue fant d l cred at th ty ck t cle days f llow g th nly c vul on th | t nt perienced O maternald ath

occ ed 1 th s g oup I c mpanso th r ma

37 pat nts c m p is d a l fat is d fice t group They e al m , adms o and h d l lop d eclamis bfreth ctoflabs Withth citr suget 1 hy D km n 13 of th pat ts 1 this group e c cla filah ng clamp

Il f th maternal d the the 3 P t nts as ere o f th 8 nf nt d ath of th peg cisnths gur of pat t tl

ve dimpant flis thin thrtvs L lu ton In all but sinst e the l tal heart b t present f m bursaft dm n Ir tu t as tan mpo tant f ct ri this gr up f f tot ath and they ca be looked upo with ut dit nal acepto as det the t emia

51



The drug is well tolerated by the infant's eye Oc cas nally a mild transitory flushing of the con juncti a is observed DANIEL G More on M.D.

#### MISCELLANEOUS

Batn M Wiker K and Win B P Artifici i Inseminati n B 1 M J 945 4

The authors give an xcellent resume of art fixed i mination in sternlity pr bl m. In cas sof male impot ne dyspa unia ejaculat ry fal r. a. d.d. fective cerv c.l.i. vas. n.a. tific all seem attou w. the husbands seem nisp ses bl. Th. t.chn.qu. of self insen. tion by th. wife is described a d.adv. cated v. hen th. first thre of th. cond. tons is

Present
Art ht 1 1 sem nation the donated s m n m y

be us di ca es f cu able male steril ty a dfr

ge teraons

The poceduce and technique fartherst insement and now the their bands seemed to be a seement of the line seement o

donors and the orga zation of artific at ns m a t n with d nat d men ar d cu s d

Th follog potent id ngers of artificials sem nation are mutind uters esset as dobs genet e ept nfromdef et d mgdprm HAYFI us ND

O Sulli an J \ nd Bo n L B Emplyment of th P to tal W m n B i M J 945

Th authors f llo ed up 30 p tients f ra l mg as s ve te m tl aft r d l y Man f th cold n t b f llo d p ti fact r 1 b ca f

changes faddess a de c to

Veryfw f th se mothers t dt w k ft

configuent Most f them felt that the d tes f

conficement Most f them selt that the d tes f bou c fe c t g t t all th m t t t In cases of fetal death or financal ste themoth rise med alle and an nou tor furn to vork.

The authors concluded that normal orking thems should not consider r tu ning to work until six months after delve y Harr Fields M D

M Donough J F Vagin 1 Bleeding from Potas slum P rm ngan te Used a an Ab rtifaci nt V E gl nd J M 945 3 89

S vtj. five cases i vaginal bleed g resulting fom the mert of potass um permanga atea an bor i i cient were rep rted f om the Bost n City II p tal. In all cases the admitting diag sis w s threatened ab tions ce not e patient ga e an accurate h tory. Upon f ther q e tio g all pa tents admitted u gp tass um perma ganate as an abort f cient O ly 6v re uccess f lin p odue ngan abor to

The ges varied from eighteen to the tyeight ye rs. Fifty the p tients wer in litiparas 38 f them having been delivered of lying babic during the pityear. The maj ity of womin had mildoly

ne mo thly p od

The chi (symptom was v ginal bleed goo g within tw ho is after the i erti in f the tallet Pwelve cases equired trailment fo shock for quired sut e u der anesthesa i the oper ting

r m ad 343 smply requed vag alpeking The type alpekine of geeul m am ation event don r m eer ded ar ceed by a black esha use lly lond in the bost in of a ran and a very all a coar a the cerval of post and a the season and a coar a the cerval of post and a coar and

th newe tystm the drain eeg glequency it that newe tystm the cidril addirent diag 1 of lleases of ag lble leg the fild barg age \ wo g dagn s m yre ult n im pripe tr tim ntad u n cesa i ter pt ome of the frg a cies

C : BH MD



both k d eys It is co clu led that decap I to n is contra ndicat las a regula m th i of treat gt b ular nephros s asso ate ! ith b chl i le of mereury poiso g the procedure be gr rad fo the ja ti nt in whom olgu ia nd nu a devel p desp t ther measures h er i s ch an event decapsu I to n should be resorte I t early a d m y under these c c mstan es prove invaluable

M ny other c nd t ns m tly u ological in h ch d capsulat ons have bee d ne a d reported in the literature are cited d liscussed a d a le uthy bibliog aphy is append I h r der is ref rr df r th e di eussi ns to the one nal JOHN W B NA M D art cle

Matle C P Evaluation of Diff at Types N phr ctomy Resl w of 247 Cases J V 1

B It 945 53 8

The n phr ctomes reported we e all performed fr m J u ry 1930 to J e 1944 at Saint Mary's a d Southern Pae se Ilospital and t the Fre ch Host tal all in San Fra ci co an l are el ssifed

acco d g to the type of operati mployed The classical n phrectomy technique was done n 154 cases with 15 d ath This m th d with the I appr ach thro gh the curvo lumba et operit li ea i cision f Albarra hockey stick cis on by Mayo with ecasi naline on of the toverte bral l gam t for m e orki g room or ev n re m al f the t lith and som t mes of the I venth rib as sually e erv d f r the adh r t diseased l l ey with a short p d ele I mal gnanci s the

n I fat a d gentle handling f the t ss mi e metastas Th clamp were l ft place n s me 20 ses a d em al fr m fo ty eight to sevents t hours I ter was evil ilo d'by ce

ndary h morrhage

b nt

Clample's neph etomy was perf rm d in 44 th a dath Th author is thusiast c but the tech q c and es tev n for kd 3s ag d by destru tive d ase whe th renal e I ca be safely isolated a dar of suff nt l gibt promitigation thut the pilicate of clamp It in usd malgna cy b t enal t bet loss i n t e trat d'eat tlertel eredblits ssu ad oth fick that it ac mpylmi ac mp y l mi g liga th ped l a d tract o

∖pho t ct v as d nottes th ut m rtal tv tl ch: f nd cat frth ex t si ope at be g car na f th al p l 1 It man file utra Itb col s t g t trt adh ir phr s ad the deructi kelnyli seat ditb the le los t r yte ettt l raltubecls be th m d c ess bl port n f the ter h w d ct t ber loss the est was m ed at a sco d rerat n lat thro gh a m dl rght r tus t L cis nth l w abd m In algany

the ports n of the bladder sur o nding the uret ral o if ce m y be removed with the ! er po to i of the u et r the m co s membrane of this eg on may be lestry d by me ns of cyst scopic f Iguration prior t operation

S beap ular nephreet my wa practiced o times with no d aths Th s operation 1 indicated in cases in which the p r re al fat is indurated and the kid ney caps le is densely adhere t to the surrounding structures a d difficult to sepa te fr m th pleura a dipe itoneum. As a rule the kidney is excised well above the point of ligation to leave a stump of renal tissue in place thin after e tip tion of the Lidney it elf p ces of re al tissue that might have been left behind and that port on of the capsule which is not adhe ent to the pe stoneum diaphragm r vena cava ar t aeted Th s is a rap d method nd cated f r the deb I tated patie t in a hom the adherent

kidney m st be rem ed with d spatch

To stag nephr ct my as the op ration of

prefer ce in is n tances again without a single d ath Of course catheter drai age a d lavage in place of the surg cal drai ag of the fi st stag shoul I be selected benev possible ho ever th pre du e is a life sa g m as re t patie t who ar bonel ssly ill and in some cas has averted unnec a sary sacr fiee f the kd ey The author s con vinced th t the perf mance f the two stag op ra tio n I d c ou ly chosen case b s played a para mountri nh lovmo tal tyr tefo neph ct my

Neph eet my by more lleme t vas tituted in 7 cases 1 th 2 de ths This 1 st r ort p ocedure was need that din patients be the cap le was so densely dh r nt t the friable pa enchyma nd sur ound gits es thit it as impossible tids et t fr e and pr ceed with subcapsular nephreel my G ded by the surg on a fager clamps a e plac d n the ped le a d the kidn y is his cted nd re mo d in f agme ts lt is adv sable to e se th kid ey in these pate nts w llah ve the point of liva

to na dlea a stump of renal t sue in s tu As a rule the wound s washed out f llow ng th

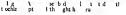
perat on of neph eetomy with about 2 ht rs f physi logical salt sol ti a d from 3 t 5 gm of mide erystals ( sually sulf nilam de) are In kled to the wou d (I nic lh hen availabl hould pov valu bl ) a d the 1 ca o 15 dra ned ith a ft rubber I nr se dran which is ith lra n about cm ch day so th t at the end of o week it has be ne tir ly r m v d The pat ent s cou ag dt g tout f bed en as early as th frst day a d th s has had no d l ter us ff ct n

nihalng The auth r wishes t mph s e the importance of f eq entr heck xamin tin fpt nts prese ting

solt ry su g cal k l ey includ g a ur e analysis flat ray films a d u g aphy Ur teral d latati tr gul nt reals a renal t be e los f th r m | g kdn y pee to the f rmati n of hydr nepbro d to stri tu f rm t on f the ntramu ral ports n of the ur t from c catreral chang s ; th bladder wall and le se a the I Lel bood of niee







lto t ch lt i



1 g Th 1 t 1 h th le th

Which looks filly flete lith cornid pocess fith all first the erilfs a lithe human hensit full time to the older and it is possible to the fith state of the control of the

Ote ch It I ce intd erb lb k 899 letusa 1te e i fa gm t i l l nd al b i fiet g in c p lly th l g bon ith tr tis nd ultig an t catlg qu trum hehm 1 a

f bod th 1 t Th n costs picars t b

t t f nc w th th a cul r s pply tra ma m t b th ch f t l s alag t Th qes tat If gm tic cl th tetertilag and th s b h niral ecr t c bo 1 pr t 11 m th rm l bo ly bloodless fbr t be l Th f os wth1 grad ] [ tu itc nil mm t I reg body t R tg grathe am a lad je n f dd fig CL

This is the arms but for tatt k f 1 th b 1 t

attack last from a day to a fort ght nigr lually such lie. They are usually br ght on by exe se e u c. At pe atto the bony but n can usually be lift deastly out of its bed. The ch. ee fap oach d p nd po the pot in fithe id as revealed b the lat rir nig gram animay b ther meter. I posteror

The care all she the same less neither he been obtained but in the line layer to not he been obtained by the see a cording the day of sparato a harply dimeat learned are of sparato a harply dimeat learned a harply dimeating the learned sparato and the see an

trates the thick essofthe 3 de and cofrmit to it. Whin a sparation take plat part 1 r c mplee truin f theosical in the humerout fit may occur either I rward to the conol of a charaction of car on loss and this 1 of cease of coin this in a ld in a the with it is 6 cases 6 ca es hive

b n r port lim th it rattur 1 which an o d

fu lin narth rattorlar sept m

These th 6 r p tell c es f h h 4 ar

called sessmum ubt 1 a loos body an 1 a

a sociated f g m cas f toch dr mates

in 5 (the uth rs ca s which came to p rati

the still call f m.

the hast I calf I gaw reth I steeched t I see as. The rish the good cate that the c dt n a 5th g but a questrat fleet of the upratrochlear septum with t vidence I bo



may r h the par it has t pr d succe f l fo t may cause epiphyseal arrest and malignancy may develop in cystic le on hich h ve been treat d hy heavy irrad at D H L m t D

### SURGERY OF THE BONES JOINTS MUSCLES TENDONS ETC

Whit GV T then it I nd as in Finger Amputations and De cription of a N w in st um at S & S 945 7

D sp t on of sc d tendons 1 finger amputs to most sa matter n h cht hr s sm di sity of i n Thet ch gs of most published orks operatie surgery recomme d s m f om f tue of thete d n ds to th ten lon sh ath r to the h n o d to preserv the great st f et n of th fingers

Lik dvocates the following pr c d f ra meta

c monhalangeal d sart cul t

The figrs byn e tended and flert dins et and allo ed to retract in the haths. The finger is freed the tiso te don cut and the small shap bladed knife the jint is pend the caps! I ligament cut ar did the finger removed.

This hyper to not the figer heh flows
the flow the flow the flow the flow the flow the flow
a cry with and A timp to secure the
do not express the flow the

duces an unusual type of disability with loss of the grpa dinability to flxth fingers into a tight fist. The mechalism fth sd sahlty sterest gand

is related to the common orig f the flexors pain it cals by the profundes group of the flexors pain it cals by the profundes group of the flexors pain of the flexors pain it calls by the profundes group of the flexors pain of

h nd as the six attempted. It is the trapactic to allo the te dons to retract within the sheath of if the ya densely adher it as if men old injury, both the prof andus and is blims should be stripped out to allow free motion. Control of the provinant phalant is exercised through the digital tensor comple. Esse t lly this e tensor complex complex on poe dol' i mbraclas a director set as a flee of the po amal phalants is hen it passes t la ward beyond the m diline of the filet is a is of the metacarpophal ngeal joint. The intership can be a controlled the province of the poet of the poet of the poet of the province of the poet of the po

strong a d give an acellent grip

D sa treutations at the d stal 1 terph langeal
1 t ramputat ns in th middl phalanx as best
t eated by d viding th flex r p of und s tendo d

allo a g t to retra t

Amputations in the t rmi al phala arely
of a t ride dia s. f. f. there a e detail the

olet ndo dns frithey aed stalt the tend n to n the hutto lk base of the t m lphalant thet din us ttachment is lift;

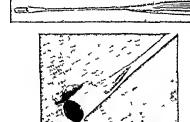


Fig. Tp Th th trum tf tpq gad hrett d th palm when d fth tend us e ed as fing up tt L ttm Close p f n g tp f t ppe

taet Rattachm nt f th e Iff pfd h libe ad tfula en ed Etiart d Int tet pgr bly d iflital illb dh tt th derly g b e and fu ct q te ell If f rse th re s probl m f n) t 1 h th la the th mb t dons should be p d d uture lt th bone ly nom la pssble

In ont m t d or i fected ses th tendon e ds should be a ch r lat th po nt of amputation adth tednh thift pnto avoid sprad f infect on to the hind Such tendons may b come adh ntadp duce d sablty They shuld be e dtof the fingrith tem cles f the hand being r li d upon fo mot on of the t mp A t nd n stripper suitable fo f eet g such t ndo s t

th had decbd
The rem 1 f d s hadherent tendo fom t carr d bed uld r q t sive i ci ons i th had if he sought ad q teps e of its e tre length E c s on tho gh small tra s erse s in the h dad rst ca h cared out c ly w th smooth t nd ns which st p a sly from n rmal su nd g ti s A adh t t don mutb freed darngike t pper ha ben de s gn d thalo then handl t desect uch adhe s sand free the t d n in mu h the s m ma ner a Mas on fasc a trpper; d to rmo long st p ffasc I ta thogh a m ll mer n the thigh The tind can thin be ered th s cond small tr see c n the wast Th stripper d s bed h foeci niiin

n an amp tat on stump a fitted ov the s ered dof the tendo ad gudd the ghethe plmonthet nd n Inthism chac slpp g f the c tting dg du g met mes v g ou d i s m fth adhes sca oto cur ndi) ryt m p tant nerve nd e sel n the palm s th p nt d R TP MO TOOME Y MD

And n R Con ntric Arth od is fith Ankle J nt A Tran nt lleola Approx h J B S g 945 8 37

fail ta dt aumat arth Sro sinf ct rt may rq perat sf fu n of th a kle j t Th d s bl g ympto s of tra m t c th rtscanh ead cat dby cc flf n Th c der ble d'ficulty in su'l g the ki mit th gb the t r pp b d i g su cal r of ta fth catlag fthe tell tt btan the dieddeg fqus (imsto 8 dges) ad light by Unatfetory immobil ton ply an mp rtat I in po sits Th tan mall 1 app bs comm add hy

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tal Add tnltbltyca b ga dbyf tbd talfil t th tb Th m thad I bl tb tc tm nt of pp t th In the p tiet hn i al gtuln I c mad oe them d Im Il 1 s hchi es et i ubp tally lit inc n m de th trailmill of which excited by tilly Th catl e ds bch dral bone f th talus a d res cted A es ct n of a varu def m ty can be made d g th s proced

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#### FRACTURES AND DISLOCATIONS

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po es to post traumat c eer b t c changes de layed non and nonuni n after fr cture \ uni na ust b diff entiate l'from bipart te scaphoi l L ors in dia n s 1 complet reducts and in ad qu te or insuffice tly prol nged imm bl ation are the most common causes 1 onum n Many c es of nonu n sho little if a y impairment of for ct on

The methods f treatme t of ununited fractures of the carpal scaph dar

r Prolonge limm ble ation

Multipl d ll ng f the fragments 3 Bone peg go grafting op ratio s 4 Eve on of one r both fragments or even

e c s nof the cnt prox mal ro of carpal bo s 5 Fusion I the scaphoid the the cap tate a d lunate

6 Artl rodesi of the wrist

The authors ackno ledge that a drill g and peg g g or grafting pe att n is more lk ly to be suc cessi I in caref lly sel cted case hen t is done by an e pe need a d skill d sure o quoted statig Many experenced urgeo s are rap dly c min t th co clusion that this operat on has n place in the tratme t of a s ldier Bohler t o ted as state g that he hal ever se n a case in which the usef I ess I the hand returned t normal aft r r moval of the scaphoil bone Cra ener and McEl oy believ that if a degener tive type f atth it s has al eady s tin obn graft ng or drill g w Il restore the wast t normal a d for ancie t unu t dfractur swith a d g nerati e arth itis only rem val f the p mal f agments ill pe mit a Hirsch ad cat dearly extrpation I the bone b fore traum to arth tis d vel ped in the ur o ni g bo h had excell nt results in o cases Se eral di erg nt jin ons ar q oted

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DANE H LEVIN in MD.

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ORTHOPEDICS IN GENERAL

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# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

#### BLOOD VESSELS

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the pr to 1 the desc and the diagness f the fistula was not made until eight months later 1 he he p tient compil ned of increa ng dyspinea o e ert.

This case demonstrates a number f interesting

po t It re e I that surgical removal of a rup tured; tervertebral d so is not without danger to the gre t vessels which I e on the anterior surface of the bod es f the lumba vertebrae and it d monstrates th t the c mm lac a tery can be int rrupted ith t endangers the v ab lity of the limb Ana tomic st dy of this egion sho is that the inferior ve a cava is formed by the union of the two common that we sto the 1ght of the median plane in front of the body of the fifth lumbar vertebra a d behind the ght c mmon iliac artery The latter crosses the d stal nd of the v cava opposit the fourth inter v rterbral d sc from right to left a d bec use of the great turged ty of the artery to yena cava is fixed t a certain e tent ag st the vertebr I column As a result of this anatomic arr ngement f the right e mmon il ac artery the inferior vena cava and the

fo th intervertebr i spac a sharp ou tor instrument such as is used for rom all a niphired interrt braid is e may tansh the artery a livein if it
sudde lof re d thr gib the ant nor l gludinal
ert brail gament. Altbough the sung on did not
ree gin that his instrument had injured these
else in this patient there seems little doubt that
the first la wa prod dithis man r According
to M. ter Talmindg a d Walke simil it lessons

to M ter Talmadg a d Walke sim l t lesions hav be prod eed by other surgeo s while they a p fform g operations for ruptu ed interve te b al d es

It appeas offh and that such a vascular lesion w uld res lt : ever uneo trollable b morrhage An naly is of the st at on h ever reveals that th blo d v h ch escapes from the e mmon il ac ar t ry w Il foll w tb path of l ast resist nee S c the venous pressu e i the inferi ve a cava s ap p ox mately er escaping arte ial blood will natu ally flo 1 to th large venou reservor of the caval ystem rather than travasate 1 to th p vertebral paces against res ta ce f th tissues The e was nd bt lly a me local e tra at on as evidenced by th abnorm I fibrous t ssu aro nd the great ves els fou d'at operat o but it c'uld not bave been massive in the abse ce of shock follow g the oper tio The diagnos f arteriove ous f stula as m d 1 th case because of the beg no g ca diae decomp sat th enlarg ment f the h rt with a ch ract rist c type of pulsat on bs rved on fluo

cope e am rati and the cont nu sthrill with spiles centuatin which was head I destor the regin if the lumboscaral articul to The sit of the fistula was localized peperatively between the right communication and the life over a case of the light and the brut wetness.

The ombophiebt the norm of the philebts as of perspicious associed on time by an absence of a clit in the lumen. It is usually must ated with a chill hight importance swell got the legion is discovered by the curse of the initial discovered by the curse of the initial discovered by the prelimination of the curse of the initial discovered by the prelimination of the curse of the initial discovered by the prelimination of the curse of the initial discovered in the curse of the initial discovered in the curse of the curse

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ituation other than the lower extremity. The clinical d g osis of phlebothromhosis is presented togeth r w than exte i e discus on on the p e en

tion of enous thrombosis

In th it summary the authors stat that in the last 200 ca es dissecti n f the femoral and hductor eins was carr ed out Like others who have ex amined the femo al v n they fi d that phlebothrombosis of the lo er extensities heg s d p vessels of the calf and tends t propagate toward the heart a d that thrombo 1 of the i mor 1 Both sets of veins alone is an uncommon occurr veins a e the most frequ nt sites of thi dist ba ce and for this rea n they a e th most important of all the po thle s urces of both fat 1 d n nfatal p 1 monary emboli Th ere no important diffe c shetween the to so ies one i gage sex r I cation of the thr mb sed calf veins

Thrombos, of the dep veins f the leg is a fire quent e e trail class of middle ged a dide patients who fany ras n whats v rmut go to b d f longer th n ve y ten d ys. This is dissaid thou throminent ymptom. Philebuts as a cause o as a complication id epectemity ein thrombon i vers up command of this

ein thrombo i i ver; u c mm n reas n s u mporta t

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car ed o t physiol gical p inciples

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Denni C Di a t r Following F m rai V in Lig tion f r Th mbophiebiti R lief by Fa el t my Clinical Case fR natimpairm nt F ll w ing Cru h l i ry S gry 945 7 64

The ic d bled verge c f pinn n m g ug o sa t th most add q teth py p t g cat th mb phlebit When th d cas demon trat d by g ms f c and fr a 1 econ m d high lig tion i the ve s box th cai 1 ed Wl and h sas occates b ver po ted o delete ous fi ct 1 om s chingh lig ton and u

The auth rtr ted a case with high I gation 1 th femoral b t e ou complicat no slevel p d Afift ve -old mail 1 nitor was seen 1 the utpatent d p time t compil nin g f as te d r m in the litig on high h does present them the big sould be made in the litig on high h does present ment below the sould not be the sou

At operation an incarcerated femoral hernia con taining necrotic omentum was found. This was repard and sulfathiazole was implanted in the sound For three d 3s postope to ely the patient h da temre ature as b gh as o F but during the next ten days he was afebrile E ght days aft r sur gery he presented a positive Homan's sign on the left a d ith te d ness and local heat in the left calf Sympathet c block 1th 1 p r cent procaine of the first second and third lumbar le els relieved the pat te tiely Twel e days after operation well ing tend rness and local infection appeared about the wo d Sulfathia ole (4 gm per day) was gi en orally and a sp te of this the t mperature ros t 1 54 F thee days later The sulfonamide was then 5t pped as it was believed that the tempe a tu e clevation may h e been due to the drug In the n vt three days the vo d healed and the tem pe to e dropp d to normal. On the tventy first post p tive day swill g tenderness and a posi ti e liomans s gn develop d in the right l er leg not r le ed by symp thetic bl ck

T o days later a firm thrombus c uld be palpated f om the knee up a d to 12 cm below the 1 gumal I gam t The calf incr ased in dameter about 8 s cm and as pinker a dwarm r than the left It was dec ded to l gate the f moral ve above the s phe no s ope 1 g und r a local a esthetic as the safest course I t eatm nt After thi as done th ent re leg was engorged and deep bl e and the patient compl in d f pain and numbness a the leg The skin was q ite t ght a d the d rs lis pedis pulse on the right as f int I spite of a procaine sympa th t c block which ga e only minim I improvement th temp rature f the right leg grad lly fell It u s est mated th t about 3 liters of fluid wer lost into the ight leg and four h urs after operation the pati nt blood pressure fell to 40/ Eleve hun dred cub c cent meters of plasma and 500 cc of blood we ne ded to return the pessue to normal S hours after operation there was a d fference of 16 cm in the c roumferene of the thighs and less d ffer nce in other measurements. The l g became mo e the a d black kint nini crea ed nd the ski temp tures fill Th t ntv ev a hours fte iem It in ig tio the deep fasc a was di ided m d lis and I ter lly above a d below the kn e Th I grapidly becam wa mer b low the knee

The days afte factor my the patient devel ped chest pa cons lid to fiver a da chill. The ray hwed a left i first a d th temp ture

l opped nd penic llin therapy

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Two days later he de el ped e id nee f throm bophleh t s in th litt we lg \ ray the apv was

koop C E a d Buillit L Gel tin a PI sma Substitut The Eff to G Gelatin Inf a onth S bs quent Typing and Cross Matchi g of th Blood with Method of Elimin ting th Ph n menon f Pseudosgl tin ti n Am J U S 945 09 8

The authors note that a ly n the course f t d n relat nas a plasm substitute it as obsert dth t th add ton of relatin to blood e thera wtoo vivo causes a defi ite accelerat the tof ed m ntat of the cryth ocyt Th ph nome soc t d with the form t on of agg gates fl a a d sh rt compact rouleaux and has bee rf d to by Ivy as pse doaggl t at Th ficts fth pseudoagglutin tion of eryth ocyte th ed m tati rate i man have been dim t td d t h b n h n that th addition of glyc to g l t n blood m tu lters the pseudoag luts at on dor e ts the increase in sed me tat nirate In asmuch glatin is being v d sapi smas bsti t te in the pr t ad treatm t f b ck a d s many patient ece g gel tin m 3 sub e quently q ire transfus o s f whole blood f the rection of ema it becomes impo tant t d term e whethe ps udoaggl t at ninterf res with the accu ate performs ce of blood typi g d matchi g The pres nt report based on ap n ences by the a thors des gued to cl rify the p bl m The preedu scarried out in vt a di vi

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## SURGICAL TECHNIQUE

#### WAR SURGERY

Wils n II Sec ndary Suture of W r Wo nd A Clinical Study of 305 Secondary Closures A S 2 945

E per e ce d r g the past year has re empha si ed certain surgical principles involved in the ma ag ment of war ounds foremost am g wh ch is seco dary cl sure. It is believed that the prin c ples involved a the succ of I ma ag me tof a younds are equally as plicable to certain traumatic

w nds n c viì pra t c

Adequate déhndement without sutu e of sar w u ds in th 1 tal stage of treatment is a neces sary principle because of the extensi e d vital tion unds the e of tissue so frequently f u d in ar cotm at nofsch ond tl fo eign m ten I the time interval ften present bet een rece pt f the 1 ) ry a d the 1 t al surg cal tre t m t d th nec sity fo a number of different su g ons to in pect the w und ithin a relat ly short period ft me This fact aloe old m ke pr mary cl a dangerous procedure except in l cases such as s me u ls i th he d face r ch t

deh d ment ithout suture requires a E te s d of tm fr heal ng u l s secondary p rio m d which aga t th m l t y cl s r pr cipl of returning the old r to duty soon as on the ther h nl us po bl S condary cl

t onal and c smetic result llym sabett ef mo rapid impr ment in the g eral c dt n ith ptietd t the claur i nopn wo d and the a dac of the ps blity of l g p ted ulcerat na large c catra hich m y r

It f om la k f blo d s pply to the c ntral area u de most suit bl for sec dary el s e ar th se i 1 g soft t es wh ch ha b n leq tly déb l d itl the past t lass h ch tbeen bi et d t f equent d g ch ges h ch pp cl clly cla a d klet tndy ad h g light f ct ъa t ts h r f erf mayh preja di el ur h rine i dof arm witd gs lt sh fed th tp cll may te theu ofdl del u th caes n which t not on les bl

Local fatrs esset lfr c d y wth ttn deq t hem t s th a da sp a d t bl po to er t pl tem i ct rs e free l m from mia i pltg Sv mia f m mad quat det nd fr m f tigue 1 n rm l ed cell them glob pls prot ad tmi C I th blood ar espec li mpo t t

Sulfo mides h be milited s t cally dicall neo pt t btt fart tt that cc - full res poll 1 a h gh r

te f taes thut th of thes d gs

Pr parat on of the wound for closure was meticu lously carried out. The opt mum method of closure va ied Clean ounds adequately déhrided within the previous five to seven days and 11th the patient fever free were cl s d with plain or vertical mattress inte rupted sutures. Wound older than ten days usually req ed period of t dressings These vounds are less ple ble the tissu s having become relat v ly fixed and they are hest cl s d after total or partial e c on

The conclus ars we edrawn fr m 3 5 seco dary closures p tformed upon 200 patients. The interval f om the tim of deh idement to the time of closure var ed f om four t f ty seven days and the size of the you d from a fe c timeters to one wou d measurg 3 by 8 hy 4 cm. The major ty of the wounds we e on the e tr mities however secondary closu was performed up n almost e ery part of th

In 70 ca es cultures wer made pro to the ope a t n and the staphylococcus was d sco e ed in 73

In some stances complet closure was best ac c mpl sh d by c ering th emander of the wound ith a split skin graft t the time of partial closure by secondary sutu S PHE A. ZIEM N M D

S ndell D H S m Surgical Aspects f the African Soldie JR A my M C p 945 84 14

These observat n ar b ed nth auth rat o ) ars of per ce as Su g cal Sp ci list and later as Office Commandi g Di 1 10n in Military II s pitals in East Afr ca wh e the bulk of patients are nata e sold ers r Askarı

It is a nov lty for the surgical ner comer to see dr s of shin g black faces contra ted g 1 st the white hed linen. The first es ential in uccessful tr tme t of the Af ican is to k ow s me th g bo thm An init 1 pr blem is the languag ties peak o ly S abili a d till the eils er cd M O ha lear ed a smattering of this lan

gu ge h i very much ha d capped The iskar's are ecru ted from the illages in the

h te la da d fen h been in close e nt ct ith bef re Thy are a fi c and warfik Eu one p pl the record form ny ce turies he shown nd with training they become first cl sold ers This com int the Service fom a p miti e h ck gr nd Li g nam d hut with n furni hings pt for f w ski s on th grou d as a couch and wa go lyalo d thorananim lhid h know noth g of byge e r san tati n ll s d et con sts m ly of posho-gr und maize meal-and veg ta bles frunt and tain mut fmat h h can gtt il ttain nd rflph) qu nlm cul

l pm tadı ery erget Th Asks an us to get will quickly that Iffcult t l phm bed wh h feel w ll There is a significant correlation between the purity (potency) of comme c 1 penicili n odium a d the irritation follow g int amusc 1 ngettin With an increase in the potency of the per ml gram there is a co esponding d c in the p in poduced.

p oduced

The t muscular ject nof pencil p d ce a g eater incide c eand intensity of pa th chi i jection of n isotonic solutif sod m chloride The is a correlation between the potency l the pencill n and its l jah transms son

Am g the three sites of injects n (b tt cks t ceps and deltoid) the least am unt f p n it fr m 1 jection 1 to the b tt cks

The no sgn ficent coll to be the continuity of the intrade min cito of picell n a detail produced by the it amuscula injection of this maintail. H. W. Fix. M.D.

#### ANESTHESIA

P ppe E M An the laf the B nd Patint Sty 945 7 6

The cos amus has been the the uge self to met of acute hurs should be performed as the a either and e possible. However, the method is the end of the letter and either a series possible to the end of the letter and either a count of a formation a lable as the fet is occurred in pop ranest term agament I the bird pt tooth in the acute of the lit a dob stag of the annum. When er possible umple

moph analges a is the meth d fcb efpn l ff the arg cal ma agem t f tebra dump toth l alone is fraght ithe d able

d gr d shold be a ded

In the becoper tall graft gad pltg and the state of and the may stype so far but or have be dearl the may stype so far but or have be dearl the major that may be tall the stump that need to be the major to the support to side and gang them to face you talk be per firmed. The fluid ball coft be part ntwo mastad the ghot the pod by the dear the matter of the part of the part of the part of the part of the graft of the part of the part of the graft of the part of the part

m t i nofplam o h le blood plam b bstttd fo sal drip f th op at tm e t ded bey dan hou d half

Complicat attibutable to esthether its ries we limited the case silter gopaism I the potop the period that the distance of the case of t

i shith it has in gift the right distribution by the matter and the matter at the right and the matter at the right and the matter at the right and right

The c current e of s lionam de drugs nd p toth I od mex t d o l really d mo stabl ill eff ts

The dt ad clos da fom 2 opt to faplaste tpf medu de eth 6pt ts the tbf hehreved membre alges a pentental ad pedop th 3 1 stass fod mpt the nesthera fokung ft g 3 cae fspn la sths dt reebbek Mary Kw. MD

Ell t H L nd Arr wood J G A th si fo Oral S rg ry in th P n e f Ca t ry d Duath rmy A esik l gy 945 6 3

The slot us of an a esthesia frorals grey the post cauty, and dathermy has also be no poblem. Ether mit to eshe be not do cat the pow of the mit to pop get flame a vy lo B ln swith a texplower to the short the has feed a therm. Chief of mb be used by the theoretic loby of the to to the shair metal tap has one of the pes not fail m. P not the loby of the post of th

Bca fthed gens of espratry dpes omb dwth esp tory betrection adb prittle by the sport of the spo

th from the maj rp t i the at cle
La oca w ia ed the top cal sthit
tb t the drug w the dra i m the market

to twarr t defit mpars without and nats The thris op fera 4 t prct st gift for perc tp toca e; tr. The pharryn f a the ted by trde ger dented at the till fullephry the color a day the till fullephry the color penns that the till fullephry the color penns that the till fullephry the color penns that day the till fullephry the color penns that the day defined the takes a thru dby flate firm t cf mesht is 11 bt. the od u der d d

Immeditly aft the tltpcal thee simplified p tth linestees a begind the state of the gitt by dr tharm grows py primard and detractable some since the state of the

elevated u til conse o s es occurs to av id any pos

siblty of asp at on 1 t the trachea Since 194 this method has been used in 80 cases

The attitude of the a th rs is favorable and the technique is being used a creasingly The s cc ss of this technique is d pe de t upon

the exte sive and ad q ate t pical anesthesia of the pharyn glott's and upper trachea M Y KAR M D

I lection from Spin I An igesia a L n F T Warning L ct L d 945 48 15

T of tal cases of p eu fomonas pyocy neame 1 giti foll wing spinal n this a are recorded. The cales c d thin three days of on nother An effort was made to dete m the p t fc ntamma C ltu swere take fr m the tap of th al e c nta n and from po ts of p ss ble c tamina th negat e results

What ribe so ce f fect the m ral is ob y u clear defined rules f r the sterilizat o f the df sp ala lgc a must be adher d appa at Recommendations for the st il at syr ges a dincedles by bol gwere gren in detail MAYLAR MD

Simp n DE C n ul i ne during G n 1 Ance th t A I el dJ II 045 3

Con uls ons may occur d r g trus chl frm vin the e thyl ne cyclop pa e as There is confusion th well as ether a esth tth lt t on the et ol gy of th e nd t i he p e ff v r seps s dhot bum dext rn l s o d g s m t be n important t l gical Oth possible caus s are an a imp tes esth ticage te ce sord fic cy feah n in th it bil ty f th ners say tem a lat nt tendency to ard fits e ot n p oduced by strep

Convul ions can app ar at ny t me altho gh the impo t nce of n u ogen c stimul is t essel with the convulsi s c mmencing at the m ment the p t n um is gr ped in the f c ps or in los soo as th re is tracti n on the viscera. The met l

its rat s bet n 20 nd 5 per cent The p per m th d of t eatme t is al rs: 1 The author suggests deepe 1 g th c nto

tococci an l heat str k

sthes a by d sco tinu g the nhal tional anesthet d suh st tuting the ntrav nous dmi istrati n of the barb turates or of m gnesium sulfat ch l yge rpl ci g ce bags on th body nd

sorting to phlebotomy nd drainage of the pin l fluid f seve hyp rte n d velops A ca e r po t is rec ded of a convuls n which I st d th rty f m nut s in a seventeen y ar old h y d n g an p pendectomy under nitrous ox detl an sth sa The blood pressure d g most f th s t m w s too high t be reco ded. The treatment a tl ed hr ght about a cessati n f th con rul on d the pati t made n u complicat d co rales ce with n e d'nce l'neurol g cal cha g's MARY KARP M D

Cole F Th U e of Curar in Ane the la A Re view of 100 Cases A esth s I gy 945 6 48

One hundred and fifty eight intravenous injections of curare were given to obtain r la ation in 100 abd m nal surgical procedures. Most of the patients

re anestbetized w th cyclopropane

C a sobtan ed by brewing the various parts of several peries of the strychnos genus. A 2 per cent st rate solution is the drug used in this series. Activ ity f the drug is due almost enti ely to the presence of a crystalli able substance d tubocurar ie chlor ide The cu re eff ct is due to the interruption f nerve impulses at the my eural i nction so that th muscle all respond neither to injected acetyl chol e nor to st m lat on of its nerve. The act on is

enti ely peripheral and is i hib ted by prostigm e Muscl's are aff et d in the follow g o der first those supplied by the cranial n rves followed by th's f the trunk nd extremities and finally the e of espiration The d phram is the last muscle t be paralyzed Recovery occurs in the reverse ord r The incidence of laryngospasm is b leved to be

smaller t hen curare has been given Endotracheal s tub t on may be facilitated by its use The use of curare with a light general inh latio al

a esthes a may ha advantages over spi al a es th a in that t elimi ates some of the unt ward signs a d sympt ms complicat g subarachnoid ery root block well as the possibil ty of perma n nt damage to the spinal cord a d spi al n rves themsel es

Two absolute contraind cations for its use are my sthen ag avis and the inabil ty of the anesthetist to perform artific al espirat on Another contra and cat on is the p esence of impair d renal funct in curare a partly destroyed by the liver and 1

D tel m at dunalt ed by the kidn y The pat nts ag vig r weight ind depth and rate f p rats n were consider d in calculating the d e B sed n weight alone a dos of 1 mgm per klg madfom to 3 mgm propund of body

w ght was us d All injections were int avenous and were made

rapidly no si gl administ ti n requiri g mo e th n t s cond U des rable s de effects c ns ted ent ely of res

pirat ry depres ion. Al td depres on was seen in 4 cas sev e depression without ctual apnea occurred in 8 cases and apnea w s s en in 4 case Art fic I respirate a had to be in tituted in 1 of the roo cases Cauti n is suggested against admin ter ing cura e w th pent that ether or tribromethanol becau e these drugs hav slight curarif rm p oper ties Ether is th m st po e ful

The youngest pat ent treated was three years and ighed 23 lh the oldest was ninety-o e years Th average dose was 73 7 mgm The nterv is betw n the first and second doses rang d l om te minutes

h ndred a d sev nty fi m nutes the a r age being se nty fo rand ight t nth m nutes While pharm cological e ide ce s ggests thit th

e cretion i curare is cry rapid nimal perime ts

ha sh wn that the drug m 3 hav om cumul

thy action

Rel at n was oned de lint no f the

co cas fair in 6 and poor case
Whil the ext a d compl t path | getal h nge
p oduced by cura n t known m t nwet t ts
seem to agree th teur phears my c tai t
c upp a la tng plac the ph mac p of a ex
thesa C j clopr ps cura omb d may w !!
becom the a thete f hoce f bd mm I
su gety.

Mas K WD

## SURGICAL INSTRUMENTS AND APPARATUS

Siz I W Th Eff t of T mperatu n th D g sti n f Coll g n Sutu nd Surg cal Gut (C tgut) by En ym s nd by th S b utan u Ti su f th F g A S f

Nati oll gn fibers f m the li o t id s are et temely re tant t maymer but whn me h calls mm ut d t t h ted th j b om l l j, ad ly dg ted by ymes Relat ely resurant acds fin h el te do can be me eated t dl te susp as s (though th oll gn may n t pa s h gb filter pap 1) and sub qu ntily n er p teted t el m hall s h t eatme t r d ns the lat vely de est ble hy m y duff et a m l dp l t e yms S mil nij the fib r dg steed d b o bed aft until the sub side of the sub

The pesn tw k w u dertal with the pupe I study quart t f, the ct of p t coll g n s a lunct on of temperatud to comp rang the list with the co the d g t u of oll gen umplit of the beautie e steuers of the lunch general that he seems to be general the seems to be greatly as the se

of clige sut es deat the blode ymsd tta k th sut s F ct nat by ntnfugat of b I blood hows th t m t I the p ote lyt a to of blod se ted that lucocyt rathe th with the pl m o rd blood c li It has t the pos bl t btanastabl prp at n f prta fmlccvtes td todterm whithro title ct tin ergs I thidges to f olla n sut s by I c cyt zym s in v t th sam sthif the dget niths t smpl tdm th tse fthe g m It m onfiat that the dtnlellge tues b th n o and n t n ases poe tially with a mpe at bt the Time stud d p b blyn t th same a th es wh h dg tth st thet the t t e ges oepd glydfir t O p ct al p tof the t dy les th po

Opetal ptofthstdyles theosel pepleatilth uilt polimilm is gry An mptatp blm ld thu featgut talend the lth ut blo hig ompleted with the ltgpnplhwund

It pp tfomthswrk ll g n nd cat gut ( lyp | mn ry catgut exp m tsh v b perf rm d th th f ) that imp tat fact d b rpt on f dt mn gthe t ld t utu es is the b dy tempe tr In pt ta c ea ed temp tur f 4 C m ht b exp cted t pode a cop c t c th at t h h d t + d ab hbl t the hm nyme (rbt l ym case funf ted w ds) b ha elke tryp mo pp m la to th t n th s If the hum n t to fog ans tmp rat f 7 C wll p du dubl nth te f de truct f th t re 1 ther t t t pp ntth t y l atto bdytmpe t myprd maked cam th t f b rpt f the s t L s t p m t wth ta dt (theligt s greal gut) and cat t mp at eff ts dges t as mil r to th 1 r th pla ut B JAMIN G LDM M D

## PHYSICOCHEMICAL METHODS IN SURGERY

#### ROENTGENOLOGY

Carr II D S nd Cl gll P Roentg n Path logy of the Chest in Battle Ca ualtles IE 945 53

Due t the diffculty of the cl cal exam att n in a severely wounled soldier and because of the multipl ty of po bl p tholog cal t d gs the aid of the roentge olog st becomes invaluable both in

dag os and sug cal 1 dgm nt

The less ns m st frequently accountered by the auth rs we ibfat e m tallefr g bodes bl st injury with hemorrhage into the lung paren chyma p moh m th ra atelecta a d tra s d ph agmatic or t ansmediast n 1 ounds \ hrick reve 18 sel et d'ease 15 g en to illustrate s me land ath biz cp thol gclapp and f th lesson

Tb pres t() h rn at f the t m cas a h nd pleen int th little chest though a nt : the left diaphragm (2) bil ary br ch l fstula (3)p t t gm tall f b ly thogh th Ift | g | ft haphragm n | 1 leen th; u them purt um but p m thrac (4) m the f g b dy th h t th t d hem r hag ibl te alplural effusi (5) tra s ä 1 (c) tra s md t leh tijry thilgm t ith m tall cfo gn body the right line (6) f g b ly th right | g th hyd of neum th a anli c dental azyg 1 b (7) me i asti al mi his ma with grad all pr d f the air t th b f the neck and (8) p lmon v fat mbol m f llo i g a I th shait i th right tib an I imple fra t

f bula All of th se c are ll tatel ith th r r

pect e ntg ogranis

gndc E per ction thtl I may similar cas! I th autho to m ke th f ll g sugg st ons

1 Beaus of the feque cy it not phys t c ls t pr f bl t amin aptent th h t jury n th pright po tion o if th5 imp ble n th lat 1 cumb nt p iti n i I r t d tect subph

O rp netrated ro ntg ga f great l dm nst t gf g boi b n ath the i ph gm b hi l th h t 3 S c h m p m th ra acc mp y gh t

ecaplated lbca f th 10 t 11 g rich f b ſt Illural fis alpecall fi ſŧ tpers vry iffe lt

4 1 oleft lu foc fina f h thrapyth thrah se n re tg to foo pleat g fet such I'm lug beess rmed at t whnth w d r ry erealentam tel thft f cl th g TL cm MD

Pomeran R Grady II G P 1 n M and Mag n M Spontaneou Ch lecy tod oden i Fis tut in a Pati nt with Pr mary flepat ma of

Rd 1 gy 944 43 58 the Ll

Spontaneous cholecyst d ode al fistula associated th p ima y hepatoma of the liver is e ceedingly rare Of spec Is gnifica c is the fact that d gnosis m y be made preoperatively by means of roentgen stud es

A detailed case report th surgical a d autopsy find gs sp esented Diagr ss as made by means of toentge grams a d flu roscop c studies Some barrum t nded in a l ear str ak near th super o po ton f the d odenum Tb s ba jum sur oun ie l a negati e h dov At fou hours th vas a 7 per cent retent n of b roum in th fundus of the st m ach on the 1 ser curvet e aspect vi lently esting aga not the left lobe of the lay r Speck retention of barrum also sc t de of th duode m in th of the p ously desc bed n gative shado Gill bladde exam at on fail d to sh any evi d ne f a gall bl d ler shado R mi at on f the ga tr tests alt tre ald that the bar m tald t th gli bladd a d diagous of cholec; t 1 d I fist 1 th a st ne in the evistic luct was mad L enlarg ment w s n t d cl

cally a d on the film To d te oo ca es f po ta ous b hars fetula have b nr po ted; thelt ture The most c m m cause of the fit I is ch onic gall bladderd case with the f mat n of cal ul h ch ev ntually per f ate int the t st al tract The neidence of i ri mary calci ma 1 th h er sl its av rag be apree t Th d gn of p mary tumor of the lv ith cholecy todu d nal fistula d agnosed pr on rate ely a de nfrmed at surg ty and autonsy is i d dr c Alth ugh rare it sho ld be k pt i

mind by the alert d ostician M the D Stell M D

N m nt W B Th Use of N w C nt t M dtum (N c Ray pak) in th F m i C era tt e T t im J Ob 1 945 49 53

rayor ke sard pqecntr tm dium c ta ing n ga ic iod e e mpoun 1 (2 4 d; x 3 odo-6 m thvi t ta hvd pv id acet e ae 1) a point me f m fp lys slal h l ft i apill b be f

Ver 1 km ber ject I di ctly int the tr can fthr ghth c cal pe ng immeli tiff g wh h roentg graph c t les e m d thipat m beintro rubbe fag flion hehh it 1 ben if ced i th t i ca its fach I thes meth I dint i deati

In the mill hill wut re cavity top lably if r late till the creat milmed ctl nt th t 1 c canal th ough the cers 1 c m

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I That th judge it 3 or accur g ph; c muts bmit n vitting b f tateme t t the C mmittee girg then me f the ph; ici n t be i vest gated and alo then me f the pi cip! of

the tr! in order that tra crpt of the at t st mo y can b obta d
That at c pt if thee t te t mo y of th ca mg ust d po at if the Commttee O by by th method ill the able to bt a true kno ledg fall the facts ad as st the arr al at a unb d nd

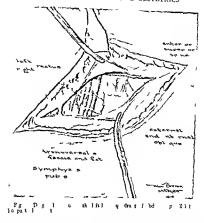
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M deal E m is The Board has pdd in por
d can pe do evoke th off nd gphys an
lc e

It ag did to le att to b d cted the rup l l ve ll s the u crup lo m d cal pert vey little c b a t p t d f m th p og m Jo nk k MD

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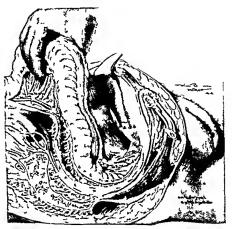
to 3 years later the homel nas mobilized at far as the splenne flexure and massions of do the rectal stump. To avoid an artificial ab dominal storia. Jerome Lynch (69) advocated amputation by the perineal route in which the bowl? divided at the level of the peritoneal floor with no attempt at approximation.

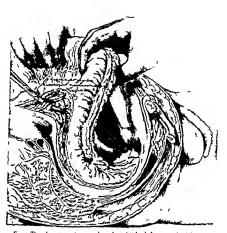
Independently under the fulle of abdomsto peruneal sacral or and excision Rere Pannett Arnold (6) I ratt Pack (80) Berveret and I nor) Wilensky and Wangensteen (68) describe their technique in one two or three stages with preservation of the spinnere musculature whise Horsley Wood and Wilke Babcock (6) I allis Arnold and Shea (1) Wangensteen (68) Dixon Dumphy as well as Zinninger and Hownorth offer cont ibution to the hierature in which the rectuo ignoid and lower's mould are mobilized and ree ected with immeds! I ree tabloshment of continuity by open or aseptic end to-end amas tomosts.

By the fore-oin, it is ob iou that remark able progress has been made toward eliminat ing a colostomy either by preservation of the sphincter musculature or by re-establi himent of continuity of the re-ected lower si-moid recto is moil or upper rectum

Why should a colostomy be avoided 1 a loved que tion. How many times after stating that an artificial openin on the abdomen 1 imperative have we heard patient say

Doctor I would rather the than ha e'a colostomy. One is prone to wonder how many yat nt have died needle sly by refus in, such an operation vikin radical surgers by other nean via so not made valiable to them surely many and to vear cur scould have been effected. Too often colo tomized pa tients are socially ostrac zed a train of p y choneurous manife tations may be suffered ein to the point of sucrele maring e may be intrifered with and many are until to employ ment and therefy refused a man of lyelf.





hood Babcock and the writer have many case, hi tories in their respective files which serve to substantiate this To date he and I have transplante I the colostom vio the perneum or anastomosed the colonic to the rectal stoma with or without resection in 51 in stances with but 1 death—mortality 1 9 per cent

In this group were two physicians and one dentist who were handicapped in the per formance of their daily tasks several domes ties vere compelled to seek positions else where a child developed a marked inferiority complex because her clas mates teased con cerning her abdominal opening a woman was unabl to hold her position in a bank an assistant sure intendent of a large Philadel phia ho pital after 2 years of service was about to be relieved of his position until trans for of the colostomy was effected an exangelist was unable to carry out his duties and in 3 marriage was postponed until tran ference of the colo tomy was made. These patients attest that they are more pleased that the discharge of offensive gas is less evident that the perineal opening is more convenient and cast r to care for and that the evacuations are more satisfactors and less frequent Should not the opinions of persons afflicted with this dreaded disease who have been subacted to a colo tomy life and now posse s a perineal anus (anal agmeido tomy) serve as an index as to its efficacy? As Horsley said a few years ago Something more than mere exi tence should be included in the objectives of urgery if the patient can be made more ecuniortable and lif 1 made to seem more wirthy lule after a precedure that offers about equal chance of cure of the cancer as other peration it is of vious that the technique should be a lonte !

The main objective in the treatment of can teer is of course complete cradication of the disease. Even though a colostomy i con if red by main secrosanct i it esential and day preservation of the pluncter mu cula tur own romes the radicability of the operation. It has become apparent that the view is this Miles (i) a to the lateral and it, putilly the inferior zone of preal nece, itality mu literation. He grant along pathom in literation. He grant taking pathom

logicoanatomic studie by Westhues in 1934 showed that cancerous connective tissue and lymph node metastases are situated at the level of the carcinoma or above it Gabriel Dukes and Bussey (42) concurred in these findings and remarked Lateral or downward lympha tic spread is only found in a late stage of the disease when the hemorrhoidal lymphatics are blocked by metastases Coller found no exidence of retrograde metastasis to nodes situated , centimeters below the primary site although Gilchrist and David (45, 46) noted a such instances Coller further observed no metastases along the lateral zone of spread where the inferior border of the lesion was a centimeters or more above the mucocutaneous junction (anorectal line) It may be assumed therefore that the inferior zone of pread is relatively unimportant whereupon the sphine ter musculature may be preserved provided the lower border of the growth is a centimeters or more above the anorectal line (6 centime ters above the anal margin) Ba ed on an experience of over 1 000 operations Lynch (70) in referring to the work of Dukes remarks It permits one to discard entirely such radical and unnecessary operations as that popularized by Miles

It seems appropriate to inquire. If the sphincters may be preserved in all cancers situated above the six centimeter level in what proportion of eases do these occur? A few years ago the author (12 13) reviewed a senes of 1995 cases of malignancy involving the amus rectum and sigmoid colon in which the distribution was accurately noted in 1401 instances as slown in Figure 1

It is codent that only 102 per cent of lessons (49 and 53) occur within the distal 53 centimeters of the bowl (above the anal margin) and 191 per cent (49 53 and 89) within the distal centimeters. It may be deduced therefrom that at least 809 per cent of cancer or those above this level may be removed without sacrifice of the phineter muscks. Wholl (71) in 1022 observed that of 461 operations for cancer of the rectum the phuneters very preserved in 27 cases the phineter with the phineter can be concluded. Wherever possible, in ituations where the tumor is at a sufficient distance from the phineters these should be pre

TABLE I -RESECTED WITH COLOSTOM

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N m	-		Reset	1	S n is	
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Lockh M mm ry (6)	1	3		8	-	
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Raif d(8)		_	5			
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J DF(3)	036	-			65	
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Sca borou h ( 3)		66	6	99	6	m te
H 5de ( )	3		766			
Pf ff (8)		8	5	3	—	m te
Ca 11()		( )				
	_				-	

served In my own series of oS radical re ections the sphincters were pre erved or continuity immediately e tabli hed in 167

cases or 80 3 per cent Does preservation of the sphincter mu cula ture augment the operative mortality? Mandl (72) is quite definite that it does not. In a combined series of 414 radical re ections for cancer Babcock (10) and the writer reported a mortality rate of 6 6 per cent for z 2 case of abdominoperinal procto immoidectomy with out colo tomy and 4 per cent for permeal proctectomy without colostomy estable hment of intestinal continuity for up per rectal rectosi, moidal and low signoidal growths has but recently become popular and while the mortality rate 1 should higher it may be assumed that with added experience the rate will be d crea ed. It vill be noted that except for the group repo ted namely 206 cases the serie are not large Zinninger and Howworth who prefer the method cite 18 sigmoidal resections with death -an operative mortality of 11 per Babcock performe ' ,6 sm<sub>o</sub>le clamp aseptic one stage re ection with , d ath or

9 2 per cent Excluding those in which opera n was done as a palliative procedure the ortality is 4 3 per cent Wangensteen (08) ports 8 ca es and Horsley , cases without a ath Over a 12 year period Dixon reports nortality rate of 12 1 per cent and 3 per it respectively for those with a view of e and tho e as a palliative procedure Of a es recently performed his mortality rate s 2 4 per cent Fallis published a eries of ca es with a mortality rate of 6 per cent rin the past year we have employed im diate end to end anastomosis in 16 in nces 1 with a view of cure and 4 as a hative procedure My fir t I due I feel to too much reliance upon welling duodenal siphonage. Since that e complemental decompre ion-usually endicostomy -has been employed without th The mortality rate for the 16 cases ever 1 12 5 per cent A di tinct ad tage of ree table hment of bowel conti is in the pelvi i the avoidance of impotence so common in abdominoperinal extirpations Jones (58) found the incidence to be

o, per cent It i difficult to compare the survival rate of an operative technique in which the sphincters are preserved with tho c in which the muscle are sacrificed because of the relati e infre quency of performance and sparsity of reports of the former In citin, the experience of variou sur cons a to cure the percenta e of operability (re-ectability) should be considered as well as the mortality Attention is called to the fact that for the mo t part the following reports were published a few years and It is only fair to as time that if more recent data were a allable the resectability and surve al rates would be increased and the

mortality decreased

I as ler surveyed the re ults acheved by exeral European surgeons including Evelober of Vienna Payr of Leipzi. Sauerbrook of Viunich Guled of Jena and kir chner of Tuebing, n the a era e and vear ure of which were 9 per cent and 3 per cent resecti els.

In contra t are a few reports where the phincter mu cle was not acrificed. Frexample Mandl (7) states that preserves

vation of the sphincters does not influence the lasting results adversely. Based on a series of our 1 coo operations the percentage of 3 year cures was higher in cases in which the sphincter apparatius was preserved (33 to 37%) than when sacrificed (25 to 34%). He maintains that similar results were obtained by Eichhoff (kuettner clinic) and I ribram (I ayr clinic). Our combined group of cases is shown in Tables I and II.

What degree of continence has been expe runced following various procedures to pre serve the sphincter muscle? Mandl (71) an ardent advocate of the Hochenegg method reported that of the cases in which circular suture was performed 193 per cent of the nationts were discharged as continent comtilete control was effected after a period of time in 40.4 ner cent Following the pull through method the number of continent attents increased from \$8 a per cent to 64 5 per cent. In contrast however is the publica tion by Koerbl of the Eiselsberg Clinic who ol served complete continence in 36 per cent employing Hochenegg technique and 66 per cent with the Kriske method. Gersuny recorded satisfactory continence in 75 per cent of hi cases Du I an a pupil of Kocher re p rte l that 8 patients had complete and 32 partial control 11 were completely incon tinent. In a di cussion of continence one should be mindful that preservation of the sphincter musculature is not nece arily syn onymous with preservation of the sphincter function. During the perincal ports n of the operation proctosi moidectoms usen th righ the external sphincter i preserved its innervation namely the inferior hemorrhoidal an I permeal nerve derived from the second third and fourth sacral pleauses ar immeally int receited allo the mall filament fr in the with sacral and coccygoal plexu -the k ser plan tenan nerve of M re tin vet following peration and in many cases within a few lays voluntary contraction can be observed uly ctively and objectively. One recall the experiment of I lhott wh found that the xternal phincies even when separated from it nerve pily was not prone to degenerate a is characteri tic of other voluntary muscles That it retain there pon iveness to the faradic

TABLE II -RESECTED-NOT COLOSTOMIZED

\ m	-	<b>\</b>	Rese to	NI t b y	Srvs	1 ve ced
V 111	۶ م	*	sel f	67	~	Y n
B benck dB ( )	Γ		93	66	8,	

Abd m pe l proc os modectom 6
P rocul proc os m dec om

current is shown at the time of sphinctero plasty usually 10 days after proctosigmoidec tomy In some 160 cases sphincteroplasty has been performed by means of a faradic stimulator e pecially designed by George C Henry M D director of Research I hysics at the Temple University Medical School As will be described under technique the sphine ter musculature is divided posteriorly it is dissected free and retracted anteriorly and laterally I reservation of the three trata of muscle bundles composing the external phine ter offers little difficulty except that it is a trifle tedious Approximation of all divided musculature is effected at the time of opera tion except the posterior quadrant of muscle because of the nece sity of presacral drainage Our great problem lies with the internal sphincter which in itself is a most important structure. Designed to aid in the expulsion of feces it also assi to occlude the anal aper ture by tonic contraction. This muscle representing an aggregate of inner circular muscle fibers of the rectum into a single com ponent measuring 2 to 5 millimeters in thick ne s and r to 3 centimeters in width (40) and innervated primarily by the sympathetic and parasympathetic nerves maintains perfection in control e pecially of flatus and liquid feces With this operation efforts to preserve this involuntary muscle have not been too pleas ing By the same token while we feel that the somatic or cerebrospinal innervation to the external sphincter 1 but minimally impaired the visceral innervation to the internal sphine ter is definitely interrupted. The inve tiga tions of Goltz and Ewald on dogs are very in teresting and latar ome influence on our problem These workers who were able to keep their animal alive for years after trans ection or de truction of the pinal cord below the seventh cervical segment observed that

while diarrhea was interposed defecation gradually became normal one or two evacua tions were noted daily and on each occa ion the rectum was well emptted Patients follow ino proctosigmoidectomy are capable of vol untary muscular contraction of varying de gree noted subjectively and objectively Ap proximately 80 per cent of our patients may be classified as continent yet perhaps 40 per cent wear a protective pad or strip of gauze not of neces ity but often because a sense of se unity from soiling a afforded. Truly our most difficult task is with constipated in dividual who for a period of year have be come accustomed to the habitual use of cathartics

## TECHNICAL FACTOR

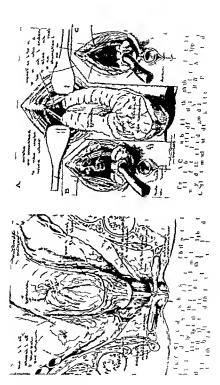
Thus far our purpose has been to con ider the developm at of surpery of the lower in testine and colostomy elimination to answer inquirie and compare variou procedure in which the sphincters are pre erved including proctosiomoidectomy with colostomized ex tirpations A substantial sene of cases namely 73 resections of the colon and rectum performed without colostomy by Babcock and the writer and recently reported (11 17) from their re pective services the department of surgery and the department of proctology has served to support previous discu ion We shall now consider our experiences and the technical factor of this operation for which reason my own series of 256 cases of can er of the anus rectum and simmoid colon from the department of proctology for the 3 year 7 month period ending April 1944 has been reviewed. In this group there were 3 female 2,6 were white 143 males and and 20 or 8 per cent were colored the average age was 32 years the extreme The distribution was a follows si moid 27 or 10 34 per ent rectosigmoid of er 3 9 per cent rectum 132 or 17 per nt and anu 10 or 3 9 per cent The histologic type in 36 of the 50 cases was reported adenocarcinoma 2 3 or 94 4 per cent epithelioma-squamous cell 6 basal cell 1 malignant melanoma 2 fibrosarcoma 2 and leiomyosarcoma mor were graded ac ording to Broder cla incation in 19 in tances grade I 17

cases grade II 1 7 or 37 9 per cent grade III

Of 2,6 patients I personally resected 208 an operability or re ectability rate of \$1 per cent The remaining 48 patient were treated by palliative colostomy exploration and closure local excision or fulguration others re fused operation or sou ht counsel el ewhere The operative mortality of the 208 ca es (16 deaths) wa 76 per cent This group included such procedures as the Mikuhez and Rankin modification Babcock's single clamp method of sigmoidectomy and those designed by Cunco Vil s Lahey Turner Hartmann and Lockhart Mummery 145 were performed by the Babcock technique of abdominoperineal or permeal proctosigmoidectomy without colo tomy and with an anal sigmoidostomy

As is our ou tom all patient are admitt d to the ho pital 5 to 7 days prior to operation A complete examination including cystometric studies is made and the patient i placed in fluid calone nitro en and electrolyte balance. Fluid freely by mouth are en coura el-a minimum of 500 to 3500 cubic centimeters daily unles contraindicated Sin c 20 7 her cent of our patients with rectal and sigmoidal cancer showed hypoproteinemia during the preoperative period the nitro en equilibrium 1 e tabli hed and maintained by a low residue diet in four feeding carbohy drate 400 oram protein 20 rams fat o \_rams and amino acid (casein hydroly ate reinforced with tryptophan) 500 to 400 cubic centimeters (130 solution) orally each day On or more blood tran fusion are admin a tered in quantitie sufficient to raise the erythrocyte count to four and one half mill on To ass t in a ording hemolytic tran fusion reactions and their sequelae sodium bicar borate ufficient to maintain a urinary pH above 701 given We have come to realize that there i a h h incidence of ubclinical avitaminosi previou ly unsuspected but a potentially dan erous stage which may occur as the re ult of diet inability to utilize vita fadure of ab orption of fat soluble vitamins in the absence of bile or depletion of ntam n reserve by excess e demand in malignancy Routinely by mouth thiamin chloride 30 milli ram nicotinamide 100





milligrams ascorbic acid 100 milligrams and pyridovine 2 milli rams are presented daily On the fifth preoperative day a nonabsorb able sulfonamide is begun by mouth and con timued to the morning of operation. Sulfasuridine succinji ulfathizazole which we have employed in 131 cases (102 proctosig modectomess) of our total screens is given in an initial dose of 0.3 gram per body kilogram weight followed by a dosage of 0.25 gram per kilogram every 4 hours. More recently sulfathialdnine phtahalykulfathizazole a sulfonamide having a smilar mode of action has been used in 54 cases including 10 proctosig modectomes. The initial dose is calculated.

ame basis

All patients in this series with the exception
of 2 with acute intestinal obstruction irre
pective of age or general condution were
operated upon under spinal anesthesia. Dur
ing the past 18 months fractional or contin
uou pinal anesthe is has been employed the
Woodbrid e formula of 0.3 per cent ponto
caine in 4 per cent dextrose solution being

on the basis of o r gram per kilogram weight

the maintenance dose is estimated upon the

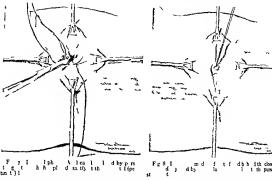
#### OPER VIION

1bdominal phase The at domen is opened throu h a left oblique incision 3 centimeters above the incumal ligament beginning at a point medial to the anterior iliae spine and ending to the right of the midline above the pubic tine Ordinarily the left anterior rectus heath is divided and in a few instances ve have detached both the rectus and pyram I lalis muscles from the pubic spine as sug ge ted by Chernes The liver is examined for metasta i the median lumbar upper and lower mesocolic areas palpated for nodules and the extent of the growth d termined The patient is placed in the Trendelenburg post tion and the pelvic cavity is cleared of small intestine by hot picks. The left lateral I af of the meso igmoid a freely divide I wide of any malignant intiltration the incision being carried do nwar I to the rect ive ical or recto uterine sulcus. In the course of the lissection th 1 it ureter that and the permatte or varian ve el ar exposed. The permatic or varian a sel may be divided an I lighted

The sigmoid with attached fat and mesosig moid! mobilized toward the midline. The peritoneum on the mesial side of the sigmoid is incided downward continued around the right pelvic brim and across the sulcus between the rectum and bladder or uterus to meet its fellow of the opposite side.

Ordinarily transillumination is employed to visualize the inferior mesenteric superior hemorrhoidal and sigmoidal vessels and their communicating arcades By such greater precision can be exercised of those to be priserved which is essential for that portion of the sigmoid to reach through the perincum The necessary vessels are clamped divided and doubly ligated If desired the lateral peritoneal leaflet of the descending colon may be divided in order to slide the bowel to a lower position. Having determined the point of viability by observing pulsating arteries or by the character of the bleeding when the small vessels on the surface of the bowel at the level of resection are incised it is identified with black silk. By gently inserting the hand into the postrectal cellular pace in the pelvis the lower pelvic sigmoid and rectum can be stripped from the anterior surface of the sa crum as far as the sacrococcy geal articulation The lateral ligaments are rendered prominent and divided as far as the upper surface of the kvator am They may or may not require ligation Interiorly the rectum is separated in the female from the upper portion of the vaging and in the male from the base of the bladder as far as the prostate Care should be exercised to avoid injury to the seminal ves icks and vas deferens. The grams of sul fathuazole powder are dusted over the viscera which is covered by the great omentum and the peritoneum i closed Interrupted sutures of \o 32 gauge alloy steel wire are introduced for fascia and \0 35 for skin

Permed phase The patient is changed to the hithotomy position on the pecially desired pinal mattres and the rectum is packed loosely with antisepticized gauze. The anal canal is closed at the pectinate or ano rectal line by a trong puresetting suture. You tenor uncition is made behind the closed annu and carried around and immediately ke low the closed anorectal line. The phincter



muscle 1 identified eparated and retracted as is done in our operation for hemorrhoid (14) The sphincter muscle is divided posteriorly Usually a single transver e inci ion throu h the fascia propria which i closely adherent to the periosteum of the lover border of the sa crum 1 all that 1 needed to mobilize the rectum posteriorly. By making traction on the bowel the levator an muscles are placed on the stretch provided the lateral ligaments have been divided during the abdominal phase The levators are clamped evered and ligated Anteriorly the superficial and deep transverse permeal muscle are retracted Cautiously the line of cleavage between the rectum and prostate 1 followed until the base of the bladder and the semmal vesicles with the vas deferens come into view In the female the rectovaninal septum 1 separated by blunt and gauze di section until the upper portion of the posterior wall and uteru are exposed Mobilization being complete th rectum and lower sigmoid are drawn through the vound and enclosed in a tovel segment of bowel identified with black silk noting viability should protrude well beyond the skin magin. An ante ior pel ne floor is

established and the permeal and antenor sphincter muscles are permitted to a une their normal position A curved perforated metal drain is inserted posteriori, alon the sacrum to evacuate blood and serim durithe first 48 hours. Dres ine are applied the extruding boxel is slit at point of or above viability (5 to 7 centimeters) to allon for it traction and a 28 gainer rubber tube; placed and tied in the bowel. This rubber tube is removed after the first bowel movement—usually the 3d or 4th po toporative day.

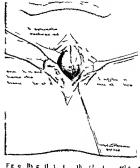
In the group namely 14 cases invasion of other or ans at the time of operation was en countered in 26 instances or 1, 9 per cent Di tribution and surgical disposition wa a follows Small intestine wa involved in 3 in stances resection in all (1 death) bladder in with partial resection in 4 uteru in hy terectomy in both va ina in 6 po terior wall resected in all pro tate in 6 partial or rese t d abdom complete in all ureter in urde exci ion. Liver meta inal parietes ta 1 was found in 7 or 7 per cent In 3 sion of regional lymph node d termined by microscopy was observed in 4 or 37 2 per cent

Of the 145 patients 137 survived the opera tion a mortality of 5 per cent The 8 deaths were as follows peritoritis in 4 pul monary emboli m 2 pneumonia 1 and myo cardial failure 1 This was an unscleeted group excluding growth within a centimeters of the sphincter musculature (6 cm of anal margin) In the series there were 49 con secutive resections with a death, an operative mortality of 2 o4 per cent

I ostoperati e treatment. The transfusion of whole blood given during the operation is followed by a per cent glucose in isotome saline solution additional blood and plasma are ordered if there i any doubt as to their need Inhalation of high concentration of oxygen is given for a minimum of 24 hours for the pur pose of effecting a reduction in the amount of nitrogen thereby diminishing intestinal dis tention (40) Wangensteen suction is in force during the operation to avoid vomiting and regurgitation of comitus into the lungs which according to Wangensteen (99) 1 the most fre quent cause of no toperative pneumonia and continued for 48 hours or more

The patient's status as to hydration and seid by e balance which cannot be divorced from each other is of utmost importance Dryness of the kin thirst and capillary turg r but especially the urinary output per 24 hours vaporization from kin and lungs comparison with presperative fluid balance and blood studies the plasma protein specific gravity of blood pla ma and whole blood cell volunic of venou blot I by means of the he mato rit and McClure Ulrich test for tissue avidity are h lpful indice while total se rum earls n hoxide content and serum chloride daily urmary chlorile concentration loss ty perfuration by duodinal uction and l v the Babcock intra ab lominal sump drain will help to a certain el etrolyte status

Nitrogen balance and the level of the ble od IT tem have but recently been recognized as important part of the prooperative and po t perative care of the cancer patient. It mu t be realized that there is a period of approximatch 2 hour fall wing prict igm adec t my wh n par nteral admini tration mu t of n cetts be employed if nitrogen quilibrium it be maintain 1. As previou ly reported



Fgo Byg dt t 1h [] t edf mith ε1 II d 1 (d) t lly

(16) in a series of 57 patients 4 or , 3 per cent were held in positive nitrogen balance after operation by the administration of whole blood blood plasma and amino acids in liberal quantitie In other word 15 or 27 per cent showed crum protein levels below 6 grams per 100 cubic centimeters. In contrast however were r, patients in whom no treatment was given of which number 15 or 88 per cent became hypoproteinemic

It is our practice following resection to give 2 00 to 4 000 cubic centimeters of fluid each day during the immediate po-toperative period or until the patient can tolerate sufficient quantities by mouth. The amounts and values usually required to maintain flind caloric nitrosen and acid base balance an proximate the following 1 000 cubic centimeters 10 per cent glucose in sterile distilled water 1 000 cubic centimeters 10 per cent glucose in physiologic saline solution with 300 cubic centimeters amino acid (13 per cent ol ) sodium lactate1 (1-100 cubic cen timeters amoul of M/6 sodium lactate dis



solved in 500 cubic centimeters 10 per cent gluco e in sterile distilled water represents a one sixth molar solution and is equivalent to 84 grams sodium bicarbonate) sodium sul fathiazole 2 grams twice daili dis olved in 40 cubic centimeter of sterile di tilled water blood plasma or livorac 50 cubic centimeters daily and whole blood 500 cubic centimeters on 1st and 3d postoperative day. Such represents a fluid intake of 5480 cubic centimeters a caloric value of 65 meters a caloric value of 65 grams sodium chloride 16 grams and sodium bicarbonate 16 8 grams.

Ordinarily the intravenous route of administration is employed but when access to vem is difficult we do not hesitate to utilize the subcutaneous and intra ternal mense of injection. In no instance ha e we encounter d any untoward reaction with blood blood plasma, plucose and saline or animo acids (5 per cent solution) when the intra ternal route has been u ed

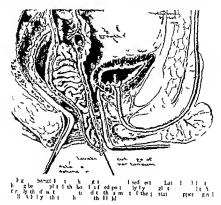
The resources offered by modern chemo herapeusis are of paramount value in p e venting and combattine infection e pecially peritornit Patients are given sodium sul fathiazole — erams twice daily beginning, the morn in following operation Guides are the urmany output the blood sulfathiazole level and the number of erythrocytes in the urme Sodium bicarbonate is used routinely. If the intravenous and oral routes are not feasible o 8 per cent sulfanilamide in one sixth modar obution sodium racemic lactate is injected subcutaneously.

Sulfa uvidine succinylsulfathiazole is given in suspension in the same dosa e as before operation namely o 5 gram per kilo ram body weight every 4 hours as soon as the pa tient 1 able to tolerate liquids by mouth usually on the 3d or 4th postoperative day As previously reported (17) in our series of 145 ca es in which an abdominoperineal proc tosi moidectoms wa performed there were 8 deaths 4 of which were due to peritonitis Of these namely 4 only 1 had been owen ul fasuvidine preoperatively but not postopera tively Sulfathalidine phthalylsulfathiazole has been employed more recently in 34 resec tions ( 9 proctosigmoidectomies) The dru i given po toperatively in amounts equal to the preoperative dose namely or gram per kilogram body weight every 4 hours in suspen

sion as soon as liquid are tolerated by mouth A definite decrea e quantitatively of the color form or, an im has been noted by stool culture. In no instance have we encountered any untoward reaction. It may be mentioned that of our total series of 208 resections to April 1944. In I idin those to September 1944 uniter abdominal souling occurred in 11 in stances as the result of perforation at the time of re-etton contamination in open ansatomos is or slipping of the clamp in closed masstomos, wet there has been no fatality.

Abdominal wound infection and dehi cene ha e been infrequent complications and to a great mea ure we believe that it has been due to the maintenance of adequate protein and vitamin C levels and to the use of oblique muscle splitting, inc ion and Babcock salloy steel wire. In our series there were z in tance of abdominal wound infection in 145 case of 15, per cent.

Followin, proctosi modectomy patients of permitted out of bed usually on the 6th to gib day and recently the majority ha c been discharged from the hospital on the 1th postoperative day. Approximation of the poterior sphincter musculature 1 made be



fore the patient leaves the hospital but if there is I urulent drainage from the presacral area the sphincteroplasty is postponed for s month. The operation require not more than 3 days hospitalization

It is worthy of mention that the presideal unund consumes about 3 weeks for complete healing and clo ure-approximately that of an

rdinary anorectal fitula. Thus in the ma jointy of our recent cases patients have been able to return to their former or perhap lighter occupations in an average of 6 t 10 weeks following operation. In our other type of at lominoperineal extirpations in which a large perineal wounds made at hast 3 month, was the average period required for healing (13)

## SUMMARY AND CONCEUNIONS

The evolution of surgical extinuation for rectal and low agmoidal cancer de igned to hounate the e tail i hment of an abdominal e lo t my has been d eu sed A serious effort is being made in this reject. It has been h un that Ir arvation of the pluncter muscles does not augment the operative mor tality In more than 80 per cent of the cases the phineter musculature may be preserved and so far as one can judge it doe not affect the rate of survival

I rom a gross series of 712 cases in which radical resection was performed without colostoms a group of 208 personal extirpa tions of the rectum and sigmoid for carcinoma has been selected as the basis for the discussion and therefore an attempt has been made to evaluate and compare impartially this serie with other present day procedures

It i our opinion that the Babcock abdom inoperineal technique of procto agmoidectomy vithout colostomy and with preservation of the phincier mu cle po sesses merit. It fer mits radical removal of the malignant bowel and gland bearing areas and in pite of a high rate of resectability (81 fc) enjoys a lov operative mortality 5 per cent in 145 feet 04 per cent in 40 conse utive resec tions it all we early dicharge of the patient from the ho 1 stal reduces the period of wound bealing and aff rd early return to work

Improvements and refinements in tech moue such as the establishment of an antero lateral pelvic diaphragm have prevented descent of small bowel into the permeal wound precise maintenance of essential blood supply has avoided retraction and necrosis and preservation of the sphincter musculature has offered varying degrees of continence. It must be realized and we are frank to admit that the sphincter function following procto stomordectomy t not perfect nor that for which we strive yet in approximately 80 per cent of our cases continence; cited and between or to 05 per cent of patients are able to carry out their daily occupations without inconvenience If one may judge from the or patients in whom the abdominal colostoms was trans planted to the perineum then a perineal anus or anal sigmoidostomy i a distinct improve ment over even a well con tructed stoma in the abdomen

Finally the phy iologic derangement of pa tients with rectal cancer in whom extirpation is contemplated is deserving of careful con sideration and therefore perial attention should be directed toward the maintenance of the fluid caloric mitrogen and acid base balance

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# ENPERIENCES WITH ANEURYSMS IN AN OVERSEAS GENERAL HOSPITAL

SAMUEL P HARBISON MD FACS M J MC AUS St L Mss

THIS report is limited to arterial in juries which have not necessitated ligation at the time of the original debridement In a general hospital in a theater of operations the majority of such cases consist of aneurysms either false or arteriovenous in type. The term pul sating hematoma is used interchangeably with false aneurysm to designate any arterial leak which results in a blood or clot filled sac into which the artery is continually pouring some blood so that a palpable thrill or an audible bruit or a steadily enlarging mas are characteristic finding The encloing may be little more than partially organized clot bounded by mu cle fascial or skin sur faces or it may be a fibrous firm reasonably stable envelope depending upon the site or duration of the lesion. In loose areolar to sue such as the retroperatoneal space a leaking Fmth G LSAmy 1 S g rv Sect



arter; gives rise to a pro res ively enlargin hematoma. Althouseh pulsation and bruit may not be detectable the process has the characteristics of a false aneury sin 1e it has the openin in the arter; the same pro resive enlargement and po sibility of hemorhage. Arteriovenous aneury sins althou ho of considerable interet do not constitute a much of a problem in thi theater as do the false aneury sims. For this reason empha 1 i laid upon the latter.

The lesions which we are discussin repre sent arterial injuries that are not usually ap parent at the time of the initial debridement They are caused by a variety of mi siles The series includes gunshot wound (rifle machine gun revolver) and all sizes of shell fragments In the formation of an aneurysm there must be one constant condition however the injury to the vessel must be partial and therefore a small fragment is the usual cause Should complete severance of a essel occur retrac tion and clotting will take place or the vessel will have to be clamped and tied and no aneurysm will be formed. These are the problems of the forward ho mital In only 1 of our cases was this condition not apparent

(see Case a) We have observed so cases of aneury min the past 20 months of overseas operation Of these 20 have been false and 10 artenovenous in type Figure i re eal several si nincart facts. Vineteen of the 20 patients with false aneurs in were operated upon. Seriou hem orrha e either externally or internally into the tissues was the indication for emergency sur er, in 12 of these The duration of the lesion aned from 4 days to 3 months In the arteriovenous roup of o cases all of them in ol and major ves el no patient was operated upon for hemorrhae If the decom pres ion effe t of the attached sidered the re ult i to be e pected Further the series shows that gangrene should rarely



fellow ligation of major vessels if there has keen an adequate time interval for the devel ipment of collateral channels and time for the restoration of blood which may have been lost in large quantity after the patient was wounded.

Often the presence of the lesion is not discontent for some days or weeks. Perhaps many mall leaks seal off and never treak d wn. In some the vised wall may have inbeen contined with later rupture through the weakened wall. In case not reported here, a false aneury sm of the Frachial artery mad, its appearance, a months after injury. In the artenovenous type there is almost alway a period of a fw. days before a diagnost in make often it is weeks or months. In this

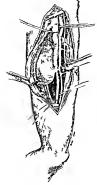
nnection it might be well to predict that many of these is tons will be discovered in the zone of the interior meet mall fistula may ause no vimptem.

Diagno is is yery implement allowers, in which a mixer roudblik Fruit is discovered. There may be a so rated pain. The murmur harlever the false type has been sy tohe in time in all our case. Often the actual vest invelved may be histicult to determine but

it is always as umed to be the major vessel until proved otherwise. In all of the arterio venous aneury sins the murmur has been continuous with a systolic accentuation. In this type, the slowing of the heart rate upon obhleration of the fistual is pathognomonic (Branham's sign), the reflex blood pressure changes have not been constant in the early cases. In certain vessels this test cannot be applied e.g. the subclavian. Venous pressure measurements may help

Differentiation between the two types of aneury in is essential because of the difference in treatment. Not only are the arteriorenous cases safe for tran port but they seem to require a longer period for the establishment of idequate collateral circulation. Hence these patients usually are executed to the zone of the interior unless intervention is indicated because of increasing nerve symptoms the association of a large unstable fals, sac or because it is nece sare to improve the distal circulation which has already been hown to be madelequate.

Change in cardiac physiology of a scrious nature are n t anticipated for 3 months at least. In Case 16 almo t 4 months after



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wounding there was demonstrable cardiac enlargement but the return to normal was rapid following operation. Tachycarda may be noted early especially in fictules near the heart but since the Army patient remains in a hospital throughout the course of his illness ob crvation will preclude any deletenous effects. Embolism are ing from either type of ancurys m has not been noted in this series

There 1 one putfall in the diagnosis A firm hard mass over which the skin is red dened is not nece sarily an abscess. In Cases 2 and 1 a preoperative diagnosi of ab cess was made. In Case 12 cons derable numble ness was required to prevent fartal hemorrhage. In another absce is heneath the anole of the jaw incision resulted in a sizeable stream of blood from the internal maxillary artery which althou he easily controlled was quite unexpected. Aspiration of any suspicious mas should always be done first. When clot or blood 1 found attention is directed immediately to the proximal and distal control points.

At the base hospital under careful observa tion it is justifiable and desirable to postpone intervention as long as possible Risk of hem orrhage or critical diminution of circulation is lessened by means of pressure dres ings immobilization and perhaps sympathectomy Every effort is directed toward carryin a limb long enough to survive on its collaterals when complete obliteration of the channel becomes necessary The majority of the limbs distal to the fal e aneurysms present a palpable pulsa tion even when the leak is a large one shown that some blood is reaching the limb throu h the main vessel Thus a slowly enlargin aneu rysm or a hematoma may be looked upon as a desirable safety valve in any case in which early ligation otherwise will result in gangrene

Collateral circulation anatomically con sists of a reasonably constant set of vessels which may take over the blood supply to a part in the event of interruption of the main artery at any given point Physiologically there is little that is constant about it Swell spasm and infection play important The evaluation of the adequacy of collateral circulation may be very difficult. If the vessel proximal to the site of injury is available for selective compression Matas test is easily applied. In many of the cases this procedure has not been possible and since the majority of the operations have been on an emergency basi the prognostic value of such procedures is slight in false aneu rysms However in the evaluation of the case there are certain guides to the safety of future operation A diminished or absent artenal pule in a warm or pink di tal ex tremity obviou ly is a good omen for one is certain that pressure is being put upon the collateral channels which are already function ing A normal pulsation prompts one to prolong the observation period as long as possible

When the circulation is critical certain observations are made to determine whether or not it is safe to observe longer. The present or absence of a distal atternal pulse is deter mined manually or by means of the sphygmomanometer. The temperature is noted with the part exposed to room temperature and the blanching reaction noted by elevation of the limb to 30 or 40 degrees. The color is quite important but may be a poor sign in dark skinned individuals. Pinkness is always a good sign but cyanosis may be misleading in that fairly good circulation may exist in its presence. Whiteness is of course significant Nail bed reactions to pressure have been found very valuable. More claborate tests even when possible in this theater have not been found to be necessary. Decisions which are based upon the data mentioned have proved sufficient.

In critical cases the value of interruption of sympathetic impulses is very great. In the emergency cases such treatment can be carried out immediately prior to the attack on the vessel. In elective cases it is usually done a week before The danger of initiating spasm during operative manipulation is reduced Five cases have been sympathectomized -3 femoral lesions and 2 popliteal In all it was felt that the procedure was of definite value Novocain block of the sympathetic chain single or repeated was done in 3 cases—1 femoral and a popliteal aneurysms. The blocks seemed helpful in all cases but whether essential or not could not be said. No help was needed in any of the upper extremity cases and no blocks were done. If uncer tainty as to the adequacy of circulation fol lowing proposed obliteration of a large vessel exists especially in emergency procedures it would seem unjustifiable not to employ sym pathectoms if the patient can tolerate additional surgery. In the lower extremity the procedure may be necessary for the later re habilitation of the limb answay Nosocain block as a test of the efficacy of proposed sympathectomy has not been satisfactory Usually the need is urgent and permanency is desired. Lumbar sympathectoms is per formed through a muscle splitting flank in cision with resection of the 2nd 3r l an l 4th cancha

In the series of false aneutysm, there were 6 cases with associated inerve injury. If the minor vessel and retroperitorial cases be omitted this mod nee becomes 65 per cent. The high rate is to be expected because of the proximity of the nerves to the great vessels.



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Although of course primary consideration must be given to the vascular lesion increas ing nerve symptoms may hasten the elective operation At times ischemic paralysis must be distinguished The increasing toughness of the fibrous tissue reaction excited by an aneu rism is a very formidable process and lysis of a nerve from this scar becomes increasingly difficult with time Thus an indication for early intervention may be to facilitate dissection if the nerve be an important one Be cause of the usually long operating time re quired to take care of the arterial injury and because of the distortion of tissues and occasional infections formal suture of nerves is seldom possible at the same time Lysis is performed and if the nerves are severed by is with simple approximation of the ends is done as a first stage procedure. Fibrin film has been used in several cases in the preparation of the bed for a subsequent formal neuror rhaphy

Giving each man adequate care in a busy general hospital leaves little time for purely investigative research into the material at hand. Visualization of these arterial listing by injection of dodrast (35%) is simple how ever and sometime may be of direct assist ance in their care. Injection of dodrast may be quite innocuous but the observation has been made that fresh clot may be laid down in ancurismal sacts following its use although no thrombosis in the vessels themselves has occurred (2). Figure 1 a and b (Case 16) shows a tray pictures of an anteriorenous ancurism of the femoral artery and vein with

basis of very convincing experiments advo cates resection of a major vessel up to the next large collateral in order to obliterate a blind pouch with consequent arterial pressure dissi pation Figure 3 shows the collateral vessel to the gastrocnemius assuming a very essential function at operation this vessel was but a thread and upon the basis of the criteria mentioned might have been sacrificed Class ical main collateral channels are subject to so many anatomical variations (see Cases 6 and 7) that we do not believe that any vessel should be sacrificed The size of the arterial branches can be very deceptive and spasm may completely conceal the importance of a vessel which is otherwise apparently insig nıficant

The following case abstracts give only the barest essential data to illustrate the fore going discussion

## CASE REPORTS

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This is the only case in which simple suture was possible and feasible

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Cases 6 and 7 are similar both as to the loca tion of the injury and chinical course up to operation Note difference in circulation after operation

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front A second laparotomy as don 1 eek later at the same hospit I for intestin I obstruction due t a Richter's type he ma H de cloped severe ab domi al p in 10 days after th s on a boat in transit to the base On admiss on h e 17 days after wound g b th laparot my 1 ounds were clean and heal ing There were a th ill and bruit over the 16 cents meter ma s in the abdome pres nting to left of the midli e Spontaneous rupture occurred next day with deep shock and rapid progress toward a mo i bund state Immediate lapa otomy was done under local anesthesia. A h ge ill defined sac was present within the mesenter es l'ati nt died on the table de pite massive blood tra sfusions The site of the sascular injury was not found at postmortem exam nation

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The remaining 6 cases of arteriorenous aneurysm were evacuated to the zone of the interior for treatment. Their lesions seemed perfectly stable and it was not justifiable to wait out the ob ervation period overseas. The single patient with false aneurysm who vas

TABLE I - ANALYSIS OF MATERIAL FIT tal cas Мj Mı Rt pnt i as loctd rel ll m j Ttal mb Hm h N Is p td p d cat E ly lects 1 ta t 1 ssel Gan D th (b th t p nt fer p) y m Ttalan ury m ( Ass rated rs I Numb ptd po Fhm h ptur f 1 ry F d T mp ircul t d tally G or e (tabla h d G or e (tablih d dm Death (unr it d b am bsc )

sent home unoperated upon had a subclavar lesion of small size which after a month sob servation became even smaller

Cases 1 4 8 13 and 14 have been previously reported in detail (3)

#### SUMMARY AND CONCLUSIONS

Observations on 30 patients with aneurysms (20 false 10 arternovenous) are presented On the basis of these case the following onclusions are drawn

The tendency of fall e aneury sms to bled unexpectedly and profusely is so marked that m such cases operation should be carred or before evacuation to the zone of the internet even if a period of 'several months' observation is required before h atton can be performed safely.

On the other hand patients with attenvenous aneury ms are much more stable do not tend to bleed require a lon er observation period and can be evacuated safely to the zone of the interior unless some indicateexists for early surgery such as for example an additional large false sac or increasin nerve damage.

Aneury ms of the retropentoneal space are serious lesion and will require the ur geon's utmo t skill to achieve success

Ancurysms may simulate absces so clock that alertness must be practiced. Aspirati n should be done at the time of operation if any doubt exists

Classical channels of collateral circulation are extremely variable. No vessel however small should be sacrificed deliberately. Spasm may obscure the importance of an apparently insignificant arterial branch.

If any doubt of adequacy of circulation exists operative sympathectomy should be performed Sympathetic block with novo

cain is temporary and cannot be relied upon in all cases at should be reserved for those in stances only in which additional surgery can not be tolerated.

## REFERENCES

## PENICILLIN THERAPY IN ACUTE OSTEOMYELITIS

W A ALTEMEIER M D FACS dJ A HELMSWORTH M D C c t Oho

THE management of acute ostcomvels tis has been unsatisfactory and the results uncertain Dia nosis has been difficult and the disease has often been unrecognized until extensive destruction of hone occurred Even when early diagnosis was made and surgical drainage instituted early a chronic suppurative process usually followed characterized by draining sinuses sequestra. tion local formation of greatly thickened and churnated new bone soft tissue abscesses and recurrent acute exacerbations. Although the original infection became greatly attenuated in time sinuses often persisted and discharged pus intermittently for years Sequestrectomy or saucerization of chronically infected bone usually produced healing but offered no guar antee against recurrences Too frequently the disease preared to he cured only to flare up after a period of months or many years. The illness has been commonly seen in childhood and the chronicity of the process required long periods of treatment which removed the child from school and physical play For these rea sons and the uncertainty of the outcome per manent personality changes became engrafted upon other sequelae of the disease such as limp deformity or ankylosis of adjacent ioints

Chemotherapy with sulfonamides used in association with timed surgical intervention aided in the management but left much to be desired

In March 1943 Florey had prophessed that one might anticipate the time when ostcompelitis treated early and intensively with pencillin would not require surgical intervention

#### MATERIAL

During the past months we have observed the results of treatment in 31 cases of acute osteomy-eluts with penicilin (Table 1).

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In the group there were 25 cases of acute hematogenous osteomy elitis of the major lon bone some of which also had involvement of the flat bones of the pelvis In addition there were 3 cases with infection of the pelvic bones only 5 of the facial and cramal bones and 1 of the ribs In 13 instances the process involved two or more hones simultaneously. The a es of 30 of the cases were in the first three decades of life illustrating again the prevalence of the disease in the young. Nine of the patients were females and 25 were males a fact empha sizing the hi her incidence of the disease in the male The portals of entry of the hemato en ous infection were apparently the pharynx or nasopharynx in 5 instances furuncles or other localized skin or wound infections in 8 in stances and unknown in the remainder Two of the patients had diabetes mellitus 1 had nckets in addition to the acute hone infection The responsible etiolo ica\_ent was determined in every instance but I and was found to be the hemolytic Staphylococcus aureus in 29 cases the nonhemolytic Staphylococcus albus in 2 the Streptococcus hemolyticus in 1 and the pneumococcus type III in I In 6 m stances the nonhemolytic streptococcus was found in the pus in association with the hemolytic Staphylococcus aureus Detailed bacte mologic examinations were made of the blood in all patients and of the pus in 21 of the cases Positive blood cultures were obtained in 20 of the cases the Staphylococcus aureus bein recovered in 19 instances and the pneumococcus type III in I The nonhemolytic streptococcus was found in association with the hemolytic Staphylococcus aureus in 2 cases

#### RETHOD

The administration of penicilin was regard of as the primary treatment of each case and every effort was made to ob erve the full effect of this single agent before any change was made in the therapeutic regimen althou hit was not always po sible to follow this procedure.

TABLE I - RESULTS OF PENICILLIN IN 34 CASES \_\_\_\_\_

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Solutions of the sodium salt of penicilin in terile physiolo ical saline with a concentra tion of 5000 units per cubic centimeter were used in all but I case in which the calcium salt was employed Care was taken to keep the solutions refrigerated at all tim s. The

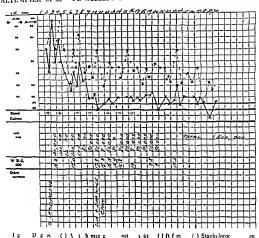
olution was administered by continuous in travenous drip in 10 cases and by interval intravenous or intramuscular injection in the r mainder (Table II) The length of the inter val usually was 3 hours but varied from 2 to 4 hours d pending upon the severity of the in

TABLE D

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fection duration of treatment and the supply of penticilin. The dose given by the interval injection varied between 5000 and 5000 Oxford units and the usual do eat the tart of treatment was 15000 units. In severe infec

tion 25 000 units were given every 2 hours for the first 3 to 6 doves. In the epatients received my penticulum intravenously by continuous dipp 30 coo to 80 000 units in 2000 cubic centimeters of physiological saline solution were



administered at the rate of 2, to 30 drops per maute. The dose, was decreased when it was apparent that the infection was will contribe. In several of the earlier cases only 140 000 to 300 000 units were received as the total dose, which should probably be contidered an inadequate amount. Experience has shown that a dose of 1,500 000 or more units a fining treef over a period of 2 or more weeks is a distribly dosage.

As mall soft these abscesses it subject they set a printed with syringe and needle and partially filled with a solution of perincillin containing 5000 units per cubic centimeter every 100 more clays. In neglected case, with large ab α sess incision and drainage was carned out after a legislate properties pre para tion. In a instances topical application was effected 1 of the sings, saturated with perincilling filled the princilling the same statement of the period of the sings saturated with period line.

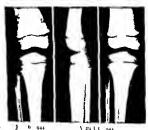
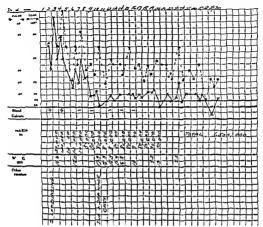


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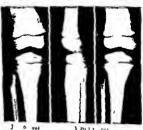
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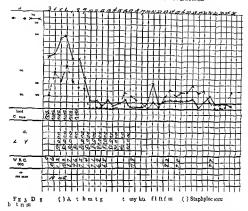
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B S. Case 7



solution In r case penicilin solution was allo injected directly into the pericardial sac after that space had been emptied of its fluid accumulation by assiration

Plaster casts were applied in approximately one half of the case for contrast with those treated without immobilization. Twenty five of the patients had re evied sulfonamide ther apy before penicillin was started and the re mainder had not Penicillin and sulfadiazine were given concurrently in a instances

The case records of 10 illustrative cases of acute hematogenous osteomyelitis of the lon bones which were treated with penicillin are reported. They have been grouped for pur poses of discussion.

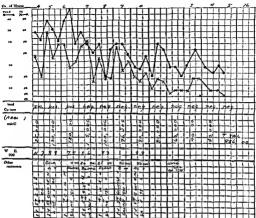
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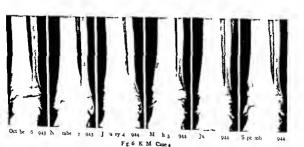
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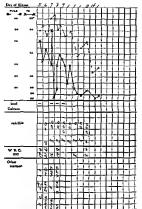
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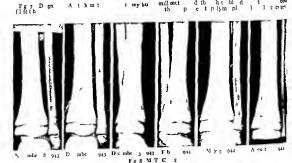
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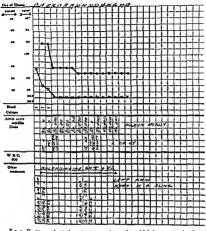
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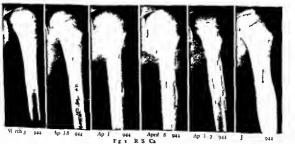
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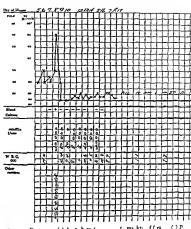


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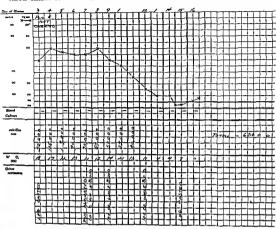




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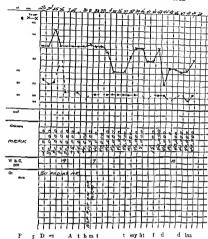
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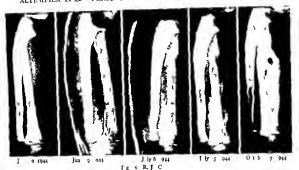
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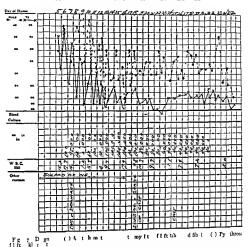
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nfection and 10 w eks before he had had epidemic m 1 g tis from which he had made a complete

E amin ti n showed an acutely ill white boy hose tempe at e was 1 4 2 degrees F There as a pr fuse nasal discharge The left foot was red hot tend r a d swollen to a level above the ankl I ge vesicle e nta ning blood stained fluid was p es

ent over the a ca of greatest swelling The white blood count was 15 250 cells with 86 per eent polymorphonuclear leucocytes and the red blood c unt w s 3 960 000 Urinalysis showed the pres no fall min nd an occasional red blood cell All bl d cultu es taken were negative Roentgenograms showed swell gin the soft tissues but unfor

t ly they showed only a small portion of the e leg

A p rat on of the flu d in the large hemorrhagie ve icle was ne fo med and e aminat on of a stained mear of this mater all showed the presence of numer ous small chined gram positive cocci. These were 1 terpr ted as str ptococe a d tentative diag osis of h molytic str ptococe e gang ene as m de

Sulf diaz ne 5 grains and an eq al amount of h ca bon te of s da w regiven e ery 4 hours Pe i eilli was sta ted on the d hospital day 10000 nits ber g given intr muscula ly e ery 3 hours (Fig 7)

The pat t condition became rapidly orse dur g the ns 1 g 24 hours a d it hecame ev de t that he would die b fo e an add to al 24 hours At the t mest was learned that the culture of the ves cle fi d h wed the Gram positive coccus to be the h molyt e Staphyloe crus a eus Immedi te oper int rvent on was decided upon. On the way to a d : the operat g room the child h d t o e vuls ns Und drop ethe a esthesia t o long 1 c 10 s wer apidly made thro gh the skin and ubcuta cous to sues of the lateral and med al as pects of the leg and fo t A necrot z g purule t infection was f and in the subcutaneous tissues over the e to e leg a d dorsum of the foot. On the love late al asp ct of the leg an area of slough with per for to was fo d in the fascia. The ound was loos ly packed with gau e neorporating four D kin s tuhes and the pat ent was retu ned to h s room 1 very poo c nd tio He ceived continuo s oxygen the apy nt vno si jection of 5 p r cent gl co e in si e sol tio a d several transf sions of 5 cub c nt met rs f f esh whole blood Penicill th apy was co to ed g ang 15 000 nn ts every 3 bours f the next 12 days and smalle dos s at the same nterv lf an add ton 1 13 days

The e was striking imp ovem nt in hi ge condition which becam e ide t within the first 4 b urs d co tin ed duri g the foll wing 7 d vs The slo ghe g tis ue in the w u d became repleced by d he lithy gree lation tessue and the wed gr d ally heal d po ta eo sly with the tcept

mall a ea 2 ce t meters in d met o r th lower lat al asp ct of the l g

Roe tgenograms 2 weeks lat show d destructio nd pe osteal eact o at the d st 1 ds of the tibia

a d fibula and involvement of the tibioastragalar mount

A I g feg cast was appl ed on the 21st day after operation and he v as di cha ged on the 47th day He as af brile at this t m and h s general condition

a ve y good A small st us tract was present and this could be traced down to the tibioastragalar joint In October 944 th p t nt began active seght bears afte emoval of the cast On November 23 1944 the wound had completely healed and the pat ent was vithout complaint Progre s roentgenograms il strate the healing which has

occurred the tibia and fibula (F g 18)

CASE 6 W E a o ye r old white boy vas admitted to th Child en s H sp tal : ext em s com g of severe pan and welling in the right leg fe e and sh t es of brath On Ap 126 1944 R diagn ss f a icella had been made a d 3 d vs later pain developed in the glitch sociated with high feer a dlocal will go On April 30 1944, he had bee admitted the april at he pital her sulfadia zine therapy we start d. When his general condit on became progress; ely worse and the s elling in the leg : creased he was tr nsferred to this hosp tal On adm sin the patient was foind to he a de hid ated palled pot at depanote a despine white be min thu decidition. The oral timpe a ture ws 1 4 degr es F Ralls e e aud ble in b th lug field The right low r leg was dematous red d ed and e q sitely t nde a diseveral large areas f fluet tion w e pr sent in the invol da en

The whit blood unt was 37 850 cell per c bic mill m ter and ur ly s sho ved nly a faint t ac of all mi The hl od ltu e was eported posit ve th too m v c lo es of h molyte St phylocoe cus u eus to co nt

The patie to condition was so desperate that it as obviou he co ld not ithsta d an sthes a or eiin and d ai age of the soft tissue ab cc s s Con rv t therapy as tarted consisting of the ent n ou adm st at n of oxyge injections of s p c nt gl co e a d al e s lutions by cont uous dip a d tr nsf s on f 200 cub c centum ters f i sh whole blood Ap ter m lded plaste splint applied t th leg fo mmobili at on Pen cill n the p) was start d mmed t ly 15 00 mis he g g en t avenously ery h lf hour for 4 d es and every 3 ho rs the e lt He fa led to r spo d to this ma gement d d d 17 h urs aft adm sion Permi s n fo autops; c ld ot be obtai ed

#### RESULTS

It is difficult to assess the value of a chemo therapeutic agent in a disease with both gener alized and localized manifestations of infection and to determine accurately the result ob tained in each case Penicillin therapy in some instances of severe advanced hematogen ous osteomyelitis with bacteriemia sterilized the blood stream saved the patient slife and

arrested the local infection yet the infection had already produced extensive bone necross. The general result obtained in such cases might be considered excellent or good but the severe local destruction of bone produced by the infection principally before the start of treatment with penicillin does not wholly justify this.

The mortality rate in this series was un questionably lessened E en though the group contained 3 cases of extensive acute osteomychist of the skull and 20 cases complicated by proved hacteriemia or septicemia only r death occurred. A severe and neglected case of acute hemato<sub>6</sub>-nous osteomyeli ti of the tibia with staphylococcal bacter emia and pneumonia was admitted to the hospital 14 days after the onset and died 17 hours later.

The results obtained in the cases of acute hematogenous osteony elits of the major long bones fell into four groups and varied with duration of disease the onset and adequacy of penicillin therapy and the severity of the infection

Group I If the correct diagnosis was made early within the first 3 or 4 days and ad equate treatment was started immediately the results were truly excellent (examples Cases 17 4) After a period of 36 to 7 hours the fever rapid pulse hacteriemia and other general signs of the severe infection be gan to disappear At the end of a week the temperature was usually normal and the pa tient looked and felt quite well. The local signs of infection such as tenderness edema and redness also began to recede after a sun ilar latent period. In this group immobiliza tion by plaster cast seemed to be of com paratively little importance and there was an early return of function In fact it was prac tically impossible to keep some children off the involved extremities as early as 2 weeks after the start of treatment Usually in this group surgical intervention was not necessary and abscess formation did not become evident

The bone changes as depicted on the roent genograms were minimal consisting of local ized periosteal reaction or small areas of patchy decalcification of the underlying cortex or both. These findings may be hard to see

and are easily overlooked. An additional 3 Cases with typical symptoms and signs of acute osteomychits were not included in the report since it was impossible to prove the diamnos in the absence of roentgenoraphic findings.

Group II When the diagnosis and treat ment with penicillin were moderately de layed the general and local infections were brought under control rather promptly after a period of 2 3 or more days durin which little or no clinical response was evident (ex amples Cases 4 5 21) In this group local soft tissue abscesses occasionally developed but they were usually small. When small they were successfully treated by aspiration and local injection of a solution of penicilin at in terval of or more days If the absce ses were large surgical drainage hy incision wa done to minimize further tissue destruction by the accumulated necrotizing hacterial toms (Case 18) When surgical draina e was insti tuted the fall in temperature was usually prompt and not delayed for 36 or more hours as in the cases treated without sur ical inter vention (Fig. 11)

The bony changes developing in these cases were of great interest Usually no chan e were visible on the roentgenograms at the beginning of treatment After a week or more had elapsed periosteal reaction and localized patchy de mineralization of the underlying bone became evident and propressively increased in extent and devree becoming most marked r to ; months after the onset of the infection (Firs 6 8 10 12) This process previously has been interpreted as representative of further extension of a chronic osteomyelitic process Re calcification of the demineralized areas fol lowed with re-establishment of a more nor mal appearance of the bone Sequestration did not occur in this group

Group III When the disgnosis and treat ment were delayed for 7 to 10 or more days and when the infection was unusually sever local destruction of hone became very great and soft itssue abscess formation and equestration occurred in most but not all of the cases. The sequestration however was filmitted extent and apparently in some cases the sequestrum acted like an autogenous bore graft.

The local infection was arrested with more difficulty in this type of case and longer pen ods of treatment with penicillin were usually required Small abscesses were treated by as piration and large ones by incision and drain age Prolonged immobilization by east in these cases seemed to be definitely indicated

The bony changes as revealed by scral roentgeno, rams at the start of penicillin treat ment showed extensive bone destruction which increased on subsequent examinations. Se questration occurred in some instances Case 3 the sequestrum was partially discharged spontaneously and in Case 22 the sequestrum is still undisturbed Small sequestra have ap parently been absorbed spontaneously and larger ones possibly have acted as autogenous grafts These bony changes and results to date are depicted in Figures 16 and 18

Group II In certain fulminating infections in which it is apparent that the patient will not live 48 or more hours to permit the man mum effect of penicillin surgical intervention after adequate preoperative preparation is still necessary as an emergency measure Penicil lin therapy is administered preoperatively and postoperatively in doses of at least 15 000 units every 1 to 3 hours. An example of this type is found in case report 29

# DISCUSSION OF THE VALUE OF PENICILLIN THERAPY

The principal bacterial cause of acute oste omvehitis is the hemolytic Staphylococcus au reus and less frequent etiologic agents are the nonhemolytic staphylococcus hemolytic strep tococcus nonhemolytic streptococcus and the pneumococcus Since these bacteria are sensi tive to the action of penicillin it is not surpris ing that this chemotherapeutic agent has such a profound effect upon the disease Stenliza tion of the blood stream and control of the generalized infection reduce the mortality rate and the incidence of metastatic or secondary infective complications If metastatic compli cations such as staphylococcal pneumonia pleuritis pericarditis thrombophlebitis etc already exist penicillin is a powerful cheino therapeutic agent aiding in their control as an adjunct to surgical or conservative treatment as indicated Thus morbidity is also decreased

Of particular interest is the control of the localized infection and the resultant roentgen ographic changes in the involved bone treated with or without surgery During the period of penicillin therapy evidence of bone damage was absent or confined to minimal changes such as slight periosteal reaction or small areas of demineralization in the underlying cortex After the cessation of chemotherapy the peri osteal reaction and mottled appearance of the underlying bone progressively increased reach ing a maximum 1 to 5 months after the onset of the infection depending upon the severity of infection. In this way the bone always looked worse a month or more after penicillin therapy than during it This picture has been interpreted as being the result of spontaneous absorption of bone destroyed early in the in fection and not as the result of continued de struction of bone by an extending chronic os teomyelitic process Following this recalcifi cation of the involved areas occurred often very rapidly Meanwhile normal growth of the metaphyses calcufication of the adjacent epiphyses and early return of function oc curred These facts suggest that adequate penicilin therapy may sterilize the infected bone converting an area of septic necrosis to one of aseptic necrosis If this is true it will necessitate our re education in the interpreta tion of roentgen findings in osteomyelitis

It has long been known that aseptic absorp tion of dead bone occurs in transplanted bone grafts (1) When bone is transplanted to an other location a considerable part of it dies but those bone cells which are still bathed in lympb and body fluids continue to live and show marked proliferation in the course of a few days Perascularization of the necrosed bone is accomplished by new vessels growing into the haversian canals from the surround ing tissues Proliferating osteoblasts accompany the new vessel grant cells appear and the dead bone undergoes absorption and con version into a series of spaces fined by osteoblasts The formation of new bone is then ac complished by these cells In this manner the graft becomes partially absorbed and then re placed We suspect that a similar process oc curs in the dead bone in acute osteomyelitis

treated adequately with penicillin

Acute suppuration of adjacent joints subsided rather promptly leaving surprismaly little residual disturbance in the function of the joint

Sequestration may still occur occasionally in acute osteomy elits treated with penucillin but only when the disease is unusually severe the disgnoss is delayed or freatment is made quate. If sequestration does occur further conservative therapy seems indicated Extrusion of a sequestrum followed by complete healing of the sinus and an excellent result has occurred in this group. Further observations are required to determine the best methods of handlins the sequestrum.

It is important to realize that no obvious clinical improvement may be apparent for a period of 48 to 72 or more hour after the on set of penicillin therapy in the patients treated without surgery This is a very trying period during which considerable pressure may be brought to bear upon the surgeon by the pediatricians internists or other surgical consult ants in favor of immediate surgical interven tion Very close observation is required and a decision to operate may become necessary if the infection becomes so evere that the pa tient will not survive the 48 or more hours necessary for full penicillin effect. In the ma ionty of instances however complicating or metastatic infections should be looked for if a sharp fall in temperature and marked clinical improvement do not occur at the end of this latent period. In the cases with large abscess treated by incision and drainage and penicil lin the clinical response in this series was im mediate

Although the is only a preliminary report there seems to be fulfied doubt that early and adequate penicilim therapy can eliminate the necessity of surgical intervention in cases of acute osteony elitis. In the pat there has usually occurred a considerable degree of secondary contamination of areas of osteonyelitis treated by surgical dramage. Devialized tissue exposed to the air invites mixed or saprophytic infection particularly by various gramnegative bacilli and it is often difficult to prevent this type of secondary infection. Second ary invaders have frequently been resistant to pencillin or even destructive to pencillin or even destructive to pencillin.

The elimination of this complication by peucillin therapy without surgery may be a venimportant factor in the arrest of the local in fective process and the spontaneous absorption of devitalized hone

Throughout the study and particularly at the start at tool, great fortitude to refin from surgical drainage in midwidual cares a advised and even insisted upon by associated pediatricians internsits or consultin surgicians. In some instances surgeons unlambar with the action of penicillin were unwillin to complete the conservative treatment and performed local surgical draina e when we bewed it was unnecessary. Later in the cours of the disease when the roentgenological appearance of the bone became so bad it again became difficult to withhold surgery in face of reports that extension of the destructive chronic osteomy elito process had occurred chronic osteomy elito process had occurred

Since the local process in the bone is essen tially one of diffusing infection characterized by purulent exudation thrombo is of adjacent blood vessels and necro 1 the dea h of bone may become extensive if the infection is L recognized or unchecked. In penicillin there is now available a chemotherapeutic a ent which can check the infection and even per mit pontaneou resolution of the osteomy elite process It is apparent therefore that early diagno is and early inten is e penicillin ther apy are extremely important if the destruction of bone is to be minimized. It must be empha sized that early diagnosis can only be made on clinical ground and little or no help is to be expected from the roent enograms for 10 of more days If there is any doubt as to the presence of an acute osteomy elitis it is bette to start penicillin therapy rather than wait until the diamosis is proven

The results obtained in some of these patents treated without immobilization were so good and recalcification was so rapid that the question of the value of immobilization by cast or splint should be studied further when penicillin is used

#### SUMMARY

During the past 21 months 34 cases of acute osteomyehits in which patients were treated with penicillin have been studied and a pre

liminary report of the results has been pre sented If the diagnosis was made early and penicilin treatment instituted promptly with out surgical drainage both the general and local infections were brought under control so thoroughly that a minimal amount of resid ual bony damage resulted Moderate delay in diagnosis and treatment increased the extent of bony damage but the infection was never theless quickly arrested without the aid of drainage and without equestration If small localized abscesses developed they were treated very satisfactorily by aspiration fol lowed by injection of a solution of penicillin If large abscesses developed prompt dramage by surgical incision was required. Delay in diagnosis and treatment not only increased the degree of bony damage but favored the development of large abscesses sequestra and metastatic visceral infections

A period of 36 or more hours after onset of penicillin therapy usually occurred before the beginning of definite clinical improvement even in the cases diagnosed early. Occasionally cases of actite osteomyelits are seen which are so fulumating that they will not survive the 48 or more hours necessary for the full effect of penicilin. Such cases must be recognized early during penicillin therapy and subjected promptly to the surgical procedure indicated

Penicilin is a powerful and effective chemo therapeutic a<sub>0</sub>ent in the treatment of acute osteomyelitis. When administered early and in adequate amounts it reduces the mortality and morbidity brings the infection under control minimizes local destruction of bone and resultant deformities permits spontaneous removal of necrosed bone and healing and makes possible early return of normal or nearly normal function.

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# THE TREATMENT OF INTRATHORACIC WOUNDS

WM M TUTTLE MD M for MC AUS Det t M hg
H T LANGSTON MD I ACS C ptain MC AUS Ch g III o
ROBERT T CROWLEY MD FACS C pt 1 MC AUS D tr t Mchen

URING the first year of our partice pation in this war the treatment of intrathoracic wounds was the subject of much theoretical conjecture since we had only the rather meager expenence of World War I upon which to base opin ions In those years which have come between these two wars knowledge of pulmonary phys iology and pathology has greatly increased This knowledge coupled with proper anesthe sia has made possible the safe performance of intrathoracic operations. Whereas such procedures were rare and accompanied by a high fatality rate previous to 1917 they now are commonplace and readily accepted surgical procedures For these reasons it might be expected that thoracic wounds would be better cared for and that in the end the results would reflect these surgical improvements

We have now been at war 2/5 years during which time we have engaged in several cam pagins in a number of theaters. A large number of thoracic wounds have occurred but only recently have large numbers of this type of injury been seen and treated by individual groups. Thus sufficient statistics are now available to be of use in formulating some definite ideas on the proper management of such

cases
In order to understand well the opmons to
be presented herein it is necessary to be some
what familiar with the train of evacuation. In
this theater surgery is done in one of three
types of hospitals. The most forward of these
is the field hospital which as a rule is set up
beside the medical clearing station. Here aux
thary surgical teams work, and to these instal
lations go the abdominal wounds the severe
thest wounds and the traumatic amputations
Further to the rear are the evacuation hospitals which handle only recent casualties and
still further back, the general hospitals where
urery of a more definite nature is done

A system of triage has been set up so that certain types of wounds go to specified gueral hospital. Such a system makes possible the evaluation of treatment and takes advantage of surgical specialists whom certain ho pital may have on their staffs.

This study i based on 320 cases of penetri ing or perforation, thoracte wounds seen during the winter and spring of 1944. The study has been divided into two groups nanely those patients who have had a thoracotom done in a forward installation for the purpose of dehriding the intrathoracie wound and a second group of patients who have been treated by conservative and supportive must meet the forward area and were evacuated to a rear echelon hospital for whatever sizingers of a more formal nature may have seemed included. The first group contains 127 patients

the second is composed of 19, cases
By thi method of grouping, an attempt his
been made to evaluate the ments of treatment
in both echelons. Furthermore a study of
these stati tres should give some idea as to
when and where formal procedures should be
done to give the his hest percentage of good
results with the least morbidity and datality.

Dehndement of the chest wall wound and closure of the suchine wound are accepted surrical procedures. The larger question is when should the debridement be carried to the intrathorace area and in which of these in junes is it necessary to perform an early the ractotiony. Injuries to the contents of the pleural cavity which have been used as an indication for performing intrathoracide bridement are listed and will be taken up equantly to determine whether or not they constitute an indication.

r Wounds of the lower chest with pos.ibl.
injury to diaphraom and peritoneal contents
2 Foreign body either metallic or bot

fragments

- 3 Wounds of the mediastinum
- A Hemothorax
- 5 Tension pneumothorax 6 Hematoma of the lung

# WOUNDS OF THE LOWER CHEST WITH INJURY TO THE DIAPHRAGE

There can be little question but that such wounds should be actively debrided and the debridement carried into the plcural space to determine the exact extent of the injury There were 51 wounds of the diaphragm in this study Forty nine of these patients had had a thoracotomy done in a forward installa tion with repair of the diaphragm. In 2 in stances wounds of the diaphragm were over looked They were both on the right and there were accompanying wounds of the liver Each of these patients developed a biliary pleural fistula with subsequent infection of a large overlying hemothorax Bronchial fistu las were also present Decortication of the lung with closure of the bronchial fistulas was done in each. In one an excellent result with complete expansion of the lung and removal of the tubes in 10 days was accomplished in the other the bronchial fistula reopened the lung collapsed and a chronic empyema must

be accepted

The remaining 49 patients did extremely
well when the gravity of these wounds is con
sidered As may be een by examining Table I
there were 10 wounds of the spleen requiring
splenectomy and 4 wounds of the boach which

TABLE I —AN ANALYSIS OF ST THORACOABOOM
INAL WOUNDS

T me t und		ves fr.	Res 1 1 1			
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Wound   lee	1	6	Poo	_	┢╌	
\ und li			F b ratery			
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thou lieu a de brou h de bra m thida (11) through de bra m were closed through the diaphragm. There were 14 instances of liver injury. In 1 patient the left kidney was injured and was removed through the diaphragmatic opening.

The ultimate results can be seen also in Table I Twenty seven cases or 55 1 per cent could be called good results the lung had ex panded well leaving a relatively normal ap pearing chest Six patients or 1 3 per cent had a fair result and in 16 or 32 6 per cent the outcome was poor These 16 patients were operated upon for the second time to correct difficulties which arose following the first op eration Thirteen patients in this latter group developed empyemas 6 who were considered to have an infected organizing hemothorax were treated by decorticating the lung 7 were treated by rib resection and drainage of the empyema One nonpurulent organizing hemo thorax was decorticated The remaining 2 patients had lungs which would not re expand and a secondary thoracotomy with lysis of constricting fibrinous bands was necessary The empsemas were healed or healing when the patients were evacuated and it is believed that none will require further surgery

Those classified as fair results were so called because of a moderate amount of pleural ob scuration in the lower chest but it was felt that they could not be improved by further

There were no deaths although 3 patients had severe liver wounds. Each became deeply interior and 1 had 4 severe hemorrhages from the liver before we were finally able to find the bleeding vessel and ligate it

The spheen is readily removed through the diaphragm. In fact it is much more easily removed through the transdiaphragmatic approach than through an abdominal incision. It seems that in civil practice this approach may have distinct ment in the removal of the traumatized spheen as it obviates the dangers of a postoperative abdominal hermia and has the advantage of a much more complete exposure of the vessels. Furthermore individuals with a normal chest so operated upon can be out of bed in 4 to 5 days.

Left thoracoahdominal wounds did better than those on the night prohably because of the complicating liver wound A common cause of trouble in right sided wounds was neglecting to drain below the diaphragm after the repair had been done. If any suggestion could be made in the care of this type of wound it would be that whenever the liver is dam aged the subphrence space must be drained. This drainage we feel would obviate many of the difficulties encountered both above and below the diaphragm.

Early treatment by thoracotomy of the thoracoabdominal wound is imperative. One has only to witness the extensive complica tions which develop when these wounds are left uncared for to become cognizant of this point It is extremely gratifying to see from these figures that of 51 such wounds only 2 were overlooked Exploration is a sound policy whenever the course of the missile has been such that there is a possibility of injury of the diaphragm Even though exploration may be carried out in the occasional case in which no diaphragmatic injury is present still this procedure will save many iodividuals long periods of convalescence and 10 some in stances their life

# METALLIC OR BONE FRAGMENT FOREIGN BODIES

There has been considerable discussion relative to the removal of intrapulmonary foreign bodies. During the African and Siculan campaigns and for several months early to the Italian campaigns size limit of 7 millimeters was set as the criterion for removal. Naturally the location of the foreign body was an important factor when removal was considered. As time has projected entire the projects of the limits of size were increased and at present only foreign bodies which exceed 15 centimeters are removed unless even though similar their location makes their presence a menace to the bost.

Some believe that a foreign body to the pleural space may be more brazardous to the host than one within the luog. In this senes we have seen only 1 intrapleural metallic for eight body which was associated with an emplema Apparently the fear is more theoretical than real. There was a tendency early in the campaign to remove metallic fragments from the lung in the forward installations. As time went on such practices were discouraged

for it was evident that no harm resulted from their temporary retention. Although forces bodies are often surrounded by a hematomate varyin, size into which have been carried in ments of clothing and other foreign substances in no instances have we see a lung abeca, develop nor do any of the authors hav knowledge of such a happening

In 30 patients in this study metallic forces bodies were removed in forward hospitals be the performance of a thoracotomy. As nearh as can be told from records which in a fewristances due to the tactical situation were inacquate the presence of the foreign body when only indication for thoracotomy. In the group there were 8 poor results or 30 7 p cent.

Io the total series of 320 patients admitte with penetrating or perforatin, chest wound to our hospital there were 68 cases in which foreign bodies were present. In 2 the force bodies were considered too small to remove 1 2 instances patients havin sizeable metali foreign bodies were too ill from other wount to coosider removal and were sent to the zor of the interior with a foreign hody retained Forty four patients had retained metallic fra meets of a size which justified remova Thirty six of these had only a foreign body a an indication for surgery and were for put poses of comparison quite comparable to th group thoracotomized in forward ho pital Io this group the only postoperative compli cation was a empyema or a poor result per centage of 7 per cent In the remainin cases the presence of the foreign body was not the only indication for thoracotomy In instances an organizing hemothorax was pres ent and in I case the foreign body was com plicated by an empyema The 7 patients were treated by decorticating the lung with a good result in each instance The 1 patient who had an empyema was treated with a rib resection and drainage and the foreign body was re moved from the pleural cavity The empyema healed and the soldier returned to himited

It becomes plain from this tabulation of results that the presence of a metallic intathoracic foreign body is not necessarily and indication for early surgery. It seems that removal soon after wounding is accompanied by a certain degree of risk. When the poor results which ran to 307 per cent following early removal are compared with those of 2.7 per cent attained in cases in which a late and more elective thoracotomy was done it be comes clear that early removal is unjustified

Bone fragments are not infrequently driven into the lung when a rib or scapula is com minuted in the process of wounding Such fragments constituted an indication for early thoracotomy in 11 cases The results were good in 7 instances and poor in 4. The reasons for classifying these 4 as poor results were as follows. In a instance an anterior thoracotomy had been done at the site of the wound cut The wound of entrance which had fractured the scapula was not debrided. Four days later a subscapular abscess was drained. On admis sion to our service a lung abscess was present At operation a long fragment of bone was found extending from the subscapular abscess to the one within the lung. We were of the opinion that the infection had traveled from beneath the scapula along the bone fragment to the lung where it had infected a hematoma Two patients still had numerous bone frag ments within the lung despite a thoracotomy for their removal These cases were observed for some time and no trouble was seen to come from the presence of the fragments fourth case had an empyema with a large bronchial fistula The lung was decorticated and the fistula closed The ultimate result was classified as fair for while the empyema healed there was still a relatively large amount of dysfunction of the affected side

Five times bone fragments were known to be present in patients who came to us without forward débridement of a formal nature. In a patient they were seen on the x ray film and were left alone as there scenned to be no indication for their removal. In 4 patients they were an incidental finding aid operation and subsequent review of the x ray films failed to establish their presence. In 2 of these 4 cases a large bronchial fistula with an empyensa was present and the bone fragment was found bying in the lung laceration. Whether its presence was the chef factor in establishment of the fistula cannot be said. It is concervable

that when the fragment was set in motion by the wounding agent it could have brdly lacer ated the lung however it is equally true that the impact of the missile alone was sufficient to tear the lung parenchyma

Certainly the case against early removal of bone fragments is not as strong as in the case of the metallic foreign body. There is some evidence to show that they may cause trouble of a sermus nature The neurosurgeons have considered them more dangerous from the standpoint of subsequent brain abscess forma tion than the metallic foreign body. How ever the comparison is not entirely valid for the reparative properties of lung and brain tissue are entirely different. We feel that there are two reasons for avoiding a forward thoracotomy in these individuals. The first is that bone fragments are often exceedingly hard to find in a badly wounded lung when the hematoma is still present and the second is that early thoracotomy carries a higher per centage of poor results than those performed at a later period. A larger series of cases is needed to establish a policy consistent with good surgical principles

# WOUNDS OF THE MEDIASTINUM HEART AND PERICARDIUM

The number of patients with wounds of this nature seen alive is by reason of their loca tion relatively small Seventeen such cases have been seen. Nine had had an early tho racotomy done Of these 3 had wounds which had lacerated the pericardium. There was i stab wound of the heart with a cardiac tam ponade which was repaired the patient sub sequently developed a purulent pericarditis which was drained and he made an uneventful recovery In another patient the heart which had been lacerated by a piece of shell frag ment was sutured and recovery was unevent Four times the mediastinum was wounded without injury to any important structures patients the missile traversed the medias tinum and came to rest in the opposite lung from which it was subsequently removed. In 3 patients in this group there was electro cardiagraphic evidence of myocardial damage The results which were obtained in these of cases were all good

Eight patients were admitted to the hospi tal with foreign bodies in the mediastinum or pericardium There were a instances of peri cardial foreign body in the fragments were removed in a the missile was extremely small and was left in place Five patients had medi astinal foreign bodies of varying size which was extremely small was not touched The remaining 4 were operated upon foreign bodies were found in 3 in 1 the missile was never located The postoperative course was uneventful in each case

Early thoracotomy should undoubtedly be done in those cases in which the posterior mediastinum has been wounded because of the possibility of esophageal injury For prac tical purposes the esophagus is the only un portant mediastinal structure the wounding of which if not followed by early repair may

give serious results

It would seem relatively safe to leave frag ments in the anterior mediastinum for subse quent removal Pericardial lacerations should be repaired but it is often difficult to tell just when the pericardium has suffered Cardiae tamponade resulting from cardiac laceration requires immediate surpery

In wound of the mediastinum as in those of the diaphragm the wound of entrance and the course of the missile will have much to do with determining whether early surgery should or should not be done If there is any ques tion as to the possible damage to important structures early surgery is the only course in keeping with good practice

#### REMOTHORA'S

Hemothorax is seen in a large percentane of chest wounds In civil practice there have been two schools of thought namely those who did nothing with the blood within the pleural space and those who felt it should be removed by aspiration From reports of these two methods of treatment the results seen ed always good. It is true that patients seen in civil life by the authors and treated by aspira tion alone did well and thoracotomy in such individuals wa rarely done When a piration was done and the blood was removed the lung promptly expanded The presence of residual obscuration of the lung on vray

examination was rare and recovery we al mo t mvariably rapid and complete. The ha not been true in all cases of hemothorax sen here Often within a few hours after wound ing it was impossible to obtain any blood from the pleural space despite x ray evidence of fluid The answer was that the blood had already clotted Such a situation led to the performance of early thoracotomy to remove the clot and suture the bleedin lun for it was felt that early removal of the clot would speed recovery. As time went on it was real uzed that so simple a solution was not the answer to a problem which constantly gath ered to itself more complications

In this study there were 31 early thora cotomies done for hemothorax alone The blood within the pleural space was not clotted in all instances From this number of theracotomies only 10 or 3 2 per cent could be called good results of the remainder 3 or 98 per cent were considered fair results and is

or 58 o per cent were definitely poor The 3 cases clas ified as fair were so called because of moderate pleural obscuration by x ray examination There is some question now on reviewing these films as to whether subsequent surgery should not have been done in r of these but our early opinion was that the lesion would clear. This it did moderately well however we feel now that in the present state of our knowledge of such things the lun

should have been decorticated The 18 cases tabulated as poor results nere so classified because of the following reasons Fourteen patients subsequently developedem pyemas Seven of these were treated by dectr ticating the lun, on the involved side 7 had a rih resection with drainage of the pleural car Most of these " ho were treated by drain age alone would now be decorticated because they represented infected organizing hema thoraces however they were seen early in our experience they were localized empyemas and it was felt safer to treat them by simple dramage Three patients who had an organiz ing hemothorax were operated upon and the lung on the involved sides were decorticated One patient had an organizing hemotherax of a mild degree and because of other wounds which complicated the situation no further

surger; was considered wise. His course was afebrile and the need for immediate surger; was not considered urgent

Eight of the 17 patients operated upon had completely expanded lunes at the time of discharge. Nine still had an empyema tube in the pleural cavity. Two of these 9 had a large bronchal fistula in a small empyema pocket. They will probably need further surgery. The remaining 7 had small empyema pockets which were obliterating.

One hundred and nineteen patients with hemothorax who had had no previous treat ment other than debridement of the chest wall wound and aspiration of the pleural cavity were admitted to our service Seventy six or 6: 8 per cent of the group cleared completely or almost so by aspiration alone Tour pa tients who had a moderate amount of pleural oh curane but not enough to require further surgery were called fair results Thirty nine or 32 o per cent failed to clear In some of these aspiration had never been possible and in others it was possible to obtain fluid early while later attempts at aspiration gave nega tive results despite evidence of fluid by x ray examination Nineteen of the 30 cases of or ganizing hemothorax were grossly inlected and must be considered empyemas

The 30 patients who failed to clear by aspi ration alone were subjected to further sur pery In 30 instances the lung was decorts cated 10 patients in this group had gross evidence of infection at the time of surgery The remaining o cases were treated by rih resection and drainage of an empyema Twenty seven of the 30 patients whose lung on the affected side was decorticated obtained good results 3 had a poor result Two of the group will have a chronic empyema and will need further surgery 1 has an empyema which slowly expanding and because of the progress made under our observation we feel the lung will completely expand In 9 instances in which a frank empyema was present and rih resection with drainage was the procedure used good results with the complete expan sion of the lung were obtained in 7 One pa tient had a large bronchial fistula and will require further surgery The remaining pa tient had an empyema which was diminishing

rapidly in size when he developed a brain abscess approximately 3 weeks after drainage and died

The question may arise in the minds of some as to when simple drainage of an em prema is resorted to and when the lung is decorticated This subject will be discussed more fully in a subsequent communication To state the problem hriefly we have decor ticated those who had evidence of an organiz ing hemotherax which was known to be par trally infected but in which liquefaction of the clot was proceeding slowly We have drained those who had a small localized empyema in which we felt that the lung was expansible and the fibrin peel had been completely liquefied With the advent of penicillin as an adjunct to surgery and a better knowledge of the sur gery involved decortication is considered a more useful procedure than open drainage in such cases for it allows the patient to have an expanded lung more quickly it obviates the wearing of an empyema tube for a long period of time and reduces the incidence of chronic empyema

To summarize these cases it will be seen that of 119 postnents with hemothorax who were not thoracotomized early 110 or 92 4 per cent had a good result 4 were classified as fair 4 as poor and 1 ded These figures should be compared with the results obtained in the group who had an early thoracotomy for hemothorax where the percentage of good results was 32 2 per cent and the poor results was 52 2 per cent and the poor results are to 38 per cent. There were 19 empyemas in a group of 119 patients treated conserva tively early as compared with 14 empyemas in 31 patients who had an early thoracotomy

It may be said that these two groups are not enturely comparable and that is granted However if the 30 patients who ultimately came to surgery late are compared with the 31 who had early thoracotomy the comparison is still straking the good result percentage in the first group being 87 1 per cent as compared with 32 2 per cent un the latter. Fur thermore 17 of the latter group subsequently underwent further surgery for either an emplema or an organizing hemothorat.

The argument has been raised that the racotomy has been done early to stop lung hleeding Lung bleeding is a transitory thing as is evidenced by the fact that in mily I case of I 7 upon whom forward thoracotomy was done was a bleeding fung seen. With the collap e of the lung which comes as the hemithorax increases the hleeding stops. Intercostal vessels have hen seen to hleed more often than the lung but these can be controlled in the original debridement by removal in a small segment of inh and ligation of the vessel. The pleural cavity need not be violated.

There can be no question but that bemo thorax as we see it here presents an entirely different picture from that seen in civil practice The method of wounding is of course different. In civilian experience the wounding agent 1 as a rule a pistol or rifle hullet of small caliber or a sharp weapon of small size The majority of these wound discussed here were produced by shell fragments which have roughed, es which whirl in their passage and do great trauma to the tissues through which they pass It is not uncommon in these woun is to see the tissues contused and bleed ing for some distance from the path of the missile Severe hemothorax has been een in instances in which the wounding missile never entered the pleural space. The dissimilarity in the wounding agents may account for the difference in the hehavior of hemothorax here and at home While there still may exist doubts in the minds of some as to the cause there is no question that a marked difference exists From our figures it seems evident that approximately 30 per cent of hemothoraces treated conservatively will need subsequent surgery However there is little question but that such a method of treatment gives infi nitely better results than can be obtained by early thoracotomy

# TENSION PNEUMOTHORAX

Strangely enough pneumothorax of a tension type has not been a serious complication in these wounds "lension pneumothorax can arise in two ways from an external wound which sucks air in but will not release it or from a lung wound which pumps air into a pleural cavity from which there is no avenue of escape. In talking to recipients of these wounds it is clear that the avenare soldher as

soon as he hears the wound suck applie pressure with his hand or lies on the wound until the aid man who promptly applies a pressure dressing arrives. These two thin's have tended greatly to obviate the dangers of the sucking wound Tension pneumothorax from the wounded lun has not been common When seen it has been treated early by aspi ration If this has failed to keep up with the air escape a catheter is placed in the chest at the field hospital In only 2 instances was an early thoracotomy done to close what was apparently a large lung laceration with tea sion pneumothoray In both instances cath eter water seal drainage had not controlled the pneumothorax Such a procedure seems en tirely justified in a wound in which catheter dramage after a reasonable len th of time has not hrought about lung expansion

Subcutaneous emphysema which has been the nightmare of older surgeons en a ed in treating the wounded has been seen only rarely in a degree to which it presented a problem There is often a small amount of air m the tissues about the wound but in only i case in this series did an emphysema of a serious nature develop. Why have these two conditions namely tension pneumothorax and ex treme degrees of subcutaneous emphyems which we worned greatly about durin those days when we were preparing for combat turned out to be of such minor importance? It seems that the establishment of the hemo thorax with a small amount of pneumothorax quickly collapses th. Ling with the result that both bleeding and air escape cease These lun, collapse quickly and uniformly because there are no adhesions to hold them to the chest wall By such a mechanism the wounds are quickly sealed It must be remembered that we are dealing with youn individuals who have been carefully screened by history and by physical and by v ray examination to rule out pulmonary disease This explana tion is also not entirely theoretical for in over 200 the acotomies which are included in the series in only cases were adhesions present which bound the lung to the chest wall Fir thermore x ray films taken soon after wound ing show that adhesions are only rarely present It may therefore be sail that x ray

TABLE II -TOTAL RESULTS FORWARD THORACOTOMY

	Good		F		P	œ .	Ţ 1	F h
		P	N .	P	N	г		N.
W d du phr gm	7	55	6	3	6	3 6		- 6
F go bods	,	653		16	8	3 7	26	
H m thork			L	8		58	3	
Bon fragmen		6 6	<u> </u>	<u> </u>	3	1-3		<u> </u>
Ten m b	<u> </u>	ļ	Ļ	<del> </del>		<u> </u>	<u> </u>	
W d <sub>e</sub> medu as m		75		ļ				
T !	<u> </u>	<u>.                                      </u>	<u> </u>			<del></del>		

screening on induction has played a part un thought of at the time of its inception

# HEMATOMA OF THE LUNG

Hematomas of the lung may result from wounds of the lung or from the contesson which occurs when the chest wall is wounded without pleural penetration. We have seen it hematoma which involved over three fourths of the upper lobe result from a wound which transected the spinal cord and lurrowed through the shoulder girdle on its way out. There was no pleural penetration.

Hematoma has presented no problem As a rule they clear almost completely in from I to 4 weeks depending on their size. On 3 occasions we have seen the hematoma hreak down and leave a round cyst like cavity which upon further observations closed leaving a normal appearing lung. One of these patients had a fluid level and coughed up old blood for some days the temperature remained normal and recovery was complete Purely on the basis of theory one mi ht expect abscesses to develop in these ideal sites. We have seen but I case in which an abscess developed and this we feel was infected from a bone fragment which communicated the hematoma with an extra pleural abscess

Large metallic foreign bodies have been seen lying, in the center of hematomas and have caused no trouble. We have come to feel that it is best to let the hematoma resolve before removing the foreign body the reason for this belief being that it would be necessary to evacuate the hematoma to remove the missile Such a procedure leaves a large defect in the line which must be closed by wedge resection

Farly in our experience such problems were encountered. If the hematoma is allowed to resolve the foreign body can be removed by simply incising the lung. It is then removed through normal tissue which can be closed with a few fine silk sutures. It is remarkable to see how normal these lungs are a few weeks after wounding.

The lung has remarkable ability to heal We have seen lungs which aside from an or gamuing hemothorax were otherwise normal which only a few weeks previous had been so badly contused that the surgeon had considered lobectomy. It is unportant to remember that a lung which a few hours after wounding may appear hopelessly damaged will be almost normal in appearance a few weeks latter.

#### DISCUSSION

We wish to make clear that the companion of the results of forward installations with our own is in no way an attempt to depreciate the work of those who see these injuries early. It is rather an attempt to learn what is best treated early and what is better treated late. The problems met here have not been met before and it is only by such candid analysis of fadure and success that we can come to conclusions which will ad our efforts.

In all 1 7 patients with thoracotomies done early have been compared with 193 treated conservatively early definitive treatment being left until later. The results of the first series are as follows 63 cases or 543 per cent are to be considered good results regardless of the indication for which they were done 11 or 79 per cent were fair results and 48 or 278 per cent were poor It was necessary to do opera

tions of a secondary nature in 48 of the 127 patients mentioned This figure represents 27 8 per cent of the total Seventeen empye mas were drained 1 lungs were decorticated for an organizing hemothorax with or without an associated empyema 3 foreign bodies were removed and I lung abscess was drained Five patients had a lung which would not expand and needed a subsequent thoracotomy with lysis of adhesions to aid re-expansion One large chest wall defect was closed

These results can be compared with those obtained in 84 thoracotomics done on this service in 9 of which the operative procedure was their second thoracotomy There were in this group 66 good results or 78 5 per cent 12 or 14 2 per cent fair results and 6 or 7 5 per

cent poor results

It becomes evident from these figures that early thoracotomy does not give the good re sults which can be expected from thoracotomy done late even at times for complications which were more serious than the original wound It has been the experience of those in this theater that early thoracotomy will at hest give about 50 per cent good results

There are certain reasons for this some of which are avoidable and others not. It seems to us that most of the poor outcomes encoun tered can be attributed to failure of the lung to expand on the side operated upon a rule has little trouble with subsequent em pyema following surgery if the lung rapidly

expands to fill the pleural space

These thoracotomies were done in many in stances on badly wounded lungs In such cases a hematoma may be present and the lung may show other pathologic states such as edema and patchy atelectasis Such states prevent proper expansion of the lung Numerous fine moist rales and rhonchi are a common findin, in these individuals. This condition has been called wet lung of trauma Great care has been taken by our forward surgeons to per form bronchoscopies after all thoracotomies but bronchoscopy while a definite help clears only the large airway obstruction Therefore a situation arises for which little can be done except to avoid thoracotomy in any case in which it is not a necessity to preserve life and lessen later complications

Hemothorax develops early and is often clotted at the time surgery is done. There is already a fine film of fibrin deposited on the lung surface which definitely impedes expan sion When this lacework of fibrin has been deposited it is almost impossible to remove it at this early stage Thus the lung expand poorly because of the fact that it is wet and a it dries it is held in the unexpanded tate by a coat of fibrin which gradually becomes heavier

There is still another factor that may have some bearing on the hehavior of some of these patients. The large majority of those case were seen during the winter of 1014 It was cold alon, the Rapido and before Cassino rain fell frequently in the low lands and in the mountains which flanked the valleys snow fell There was little shelter many of the troops had respiratory infections. Evacuation was difficult becau e of the terrain and wounded men often lay for long periods before they could be removed. This combination cert all increased the hazards of a wet lung or laid the groundwork for it

There have long been two schools of thought as to the advantage of dramin the pleural cavity after surgery We were impressed with the frequency with which the thoracotomies were closed without drainage. To us it had always seemed that water seal dramage for a period of 48 to 72 hours after intrathoracic surgery had distinct advanta es In this group no dramage was used in 37 cases A compar ison of the good and poor results from the dramage standpoint i enli htening In 90 patients who had thoracotomy and were drained the results were good in 60 per cent of the ca es Whereas in 37 cases in which drain age was not done the results were good in only 35 r per cent Such results lend credence to the belief of a large number of thoracic surgeons that dramage of the pleural cavity after intra thoracic surgical procedures has virtue This fact it seems is doubly true in these types of injury in which rapid lung expansion is \$ prime factor in the avoidance of empyema There were 54 patients in the entire series of

320 who developed an empyema or an in cidence of 16 8 per cent Empyema occurred in 34 of the 127 patients who had early

thoracotomy or 6 3 per cent There were 20 cases of empyema in 193 patients treated con servatively early The incidence of empyema in these patients who had an early thor acotomy done is lower than has been the experience of some other groups in this area. The reason for this we do not know unless it be that when an organizing hemothorax was present we adopted a policy of early decortication of the lung Early in the Tunisian and Sicilian campaions it was not uncommon to see in dividuals who had an organizing hemotherax develop empycma in from 6 to 8 weeks after wounding It is our experience that a very he h percenta e of organizing hemothoraces are infected as demonstrated by positive cul tures of the peel even though the clinical course would belie it Thus early removal of the peel may have obviated the development of an empyema in a number of our cases. We base adopted a policy of decorticating these lungs from 3 to 4 weeks after wounding Earlier attempts find the peel too friable to be consistent with good removal

There were 6 patients in the entire series who we believe will need further surgery to restore them to normal beings Four of these have unclosed bronchial fitulas 2 have a moderately lar e chronic empyema Empy emas which have developed on the basis of an infected hemothorax in our experience and in that of others have often become ehronic Decortication of the lung in these cases has been of great aid in preventing the occur rence of chronic empyema Sixty one of the total series returned to full duty 104 returned to limited service which included all types of duty except combat Sixty one were sent to the zone of the interior because of the severity of their chest wounds. Ninety were sent to the zone of the interior because of other wounds their chest wounds were healed and would not have hindered their return to full or limited service. Thus, of 320 penetrating or perforating chest wounds 255 were able as far as this type of wound was concerned to return to full or limited duty

There were 4 deaths in the entire group or an incidence of 1 2 per cent. The causes of these deaths are as follows. One patient who had had an early thoracotomy for a hemotho

rax and who had an excellent result developed a pulmonary embolus 20 days after operation One patient who developed an empyema fol lowing a hemothorax and who was treated by open dramage died approximately 3 weeks later of a brain abscess. The third patient was admitted in extremis 3 days after wound ing with a hemopicumothorax and a trans verse myelitis at the 4th dor al A catheter was placed in the left pleural cavity He failed to improve and died within 10 hours of admis sion The fourth patient was admitted approximately 10 days after a severe chest and abdominal wound An abscess was present in the left upper lobe and a peritonitis with a paralytic ileus was present. Decompression with a Miller Abbott tube was done. Three days later the abdominal wound disrupted This wound was repaired but death occurred

4 hours later

When the number of complications which arose in this series and the everity of wounds are considered a group of 6 patients is not too great a number to return home for further surgery.

We feel that a number of factors have made such results possible In the last war one large factor in the invaliding of large numbers of soldiers was the presence of a chronic empoyema Decortication of the lung while an old and discarded procedure has in many instances in this series spelled the difference between a relatively normal cheest and a chronic empoyema. In fact in the group of empoyemas cited here several were 3 months old and chronic when we first saw them. Their lungs were decorticated and they are now well

Early intrathoracic débridement in the thoracoabdomnal wound has without doubt saved many lives. It restored the integrity of the respective body cavities which had been destroyed by wounding. Many of the patients mentioned would have surely died had it not been for the carly and adequate care which they received.

It becomes clear that he pitals are very necessary near the lines. It is also clear that the personnel of these installations must be well trained surgical specialists in order to be able to cope with the heavy and intricate problems which face them. It is distinctly a credit to our Army that the man power and maternals have been made available in these places. If lives are to be saved it is necessary to have forward installations with men and equipment capable of restoring deranged physiology. It is likewise necessary to have farther back centers containing suitably trained surgeons to care for the pathologic conditions produced by early injuries. Such advantages we have had and to us the results here tabulated reflect it.

Chemotherapy has been used when it was thought to have virtue. In the patients oper ated upon by us the sulfonamides bave been The hacterna encountered u ed but rarely were known to be resistant to this type of therapy and therefore no good reason could be seen for their use Penicillm was available in large amounts only during the last months of the time in which this work was done. It is our present feeling that it has been of dis tinct aid but hecause of lack of an adequate comparative series our ideas are still not fully crystallized Undoubtedly the greatest factors have been the adequate repfacement of blood loss and careful surgery Before exten sive restorative procedures are undertaken the blood picture should he as near normal as is possible. This may mean waiting a few days At times as much as 3 000 to 4 000 cubic centimeters of blood are given. We have found that the delay in these cases is well worth while

Proper anesthesics administered by well trained physicians and nurses have been of great value. Intrutracheal nitrous orude gas oxygen and ether anesthesia has been routinely used. It is evident to us that much of the work could not have been attempted had not excellent anesthesia methods been available.

These results we believe reveal that lung wounds properly treated can and do give en couraging results. They also indicate that definite survery should be done whenever pes sible in the theater because of the high per centage of patients capable of returns to some form of duty

#### SUMMARY AND CONCLUSIONS

- Three hundred and twenty cases of pene trating or perforating wounds have been ob-
- served and the results of treatment recorded

  The results of early definitive ur en
  have been compared with delayed definitive
- surgery
  3 Fifty four empyemas developed or an
- incidence of 168 per cent
  4 Sixty one patients returned to full duty
  104 to immited duty in this theater 50 wer
  returned to the United States becaue of
  wounds other than the chest wound which
  was healed and would not have hindered re
- turn to full or limited duty 61 were returned to the United States because of their chest wound 4 died 5 Six patients will need further surgery to obliterate a chronic empyema 4 of which had
- an accompanying bronchial fistula
  6 Hemothorax is hest treated by early
  a piration if clotting occurs and organization
  takes place decortication of the lung should
- be done
  7 Early thoracotomy for clotted hemothorax does not obviate the possibility of a
  later organizing hemothorax and the percent
  age of empyemas is higher than in the coner
  valuely treated group
- 8 Intrapulmonary foreign bodies are removed from the lung with a lower percentage of poor results after the acute process of wounding is past 1e 2 to 3 neeks after wounding
- o Early thoracotomy is indicated in wound of the mediastinum especially the posimely astinum in wounds of the diaphragm and in tension pneumothorax not controlled by catheter drainage

# EXPERIENCE WITH LUMBAR SYMPATHETIC GANGLIO NECTOMY FOR WOUNDS OF MAJOR BLOOD VESSELS OF THE LOWER EXTREMITY

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▼ IVILIAN experience with sympathec tomy in the treatment of vascular disease made us anxious to deter mine whether or not this operation would be of value in the management of acute peripheral vascular trauma due to war wounds This report is based on observations made in first priority surgical hospitals (pla toons of field hospitals) over a period of 11 months During this time we have treated approximately 500 freshly wounded urgent battle casualties with wounds of all types Only 4 of these patients had wounds for which we felt lumbar ganglionectomy to be indicated and in these 4 the operation was performed We have done sympathectomy on 4 additional patients seen in consultation with other sur geons of the group These 8 cases form the basis of the report. The series is small but it will be appreciated that the number of pa tients for whom gan lionectomy may be con sidered form a very small percentage of the casualties seen in a fairly extensive and repre sentative surgical experience

We believe that patients presenting periph eral vascular wounds should have ganglionee tomy performed for the following reasons

- t To encourage collateral circulation as far as possible by promoting a regional vaso dilatation in the extremity Ganglione tomy does this by interruption of the sympathetic vasoconstrictor impulses
- 2 To relieve pasm in the arterial tric of the extremity in the knowledge that extra vasospasm may exist either with or vithout gross migury to a vericle wall

There he pointed how fg 1 1 1 team f u 1 ry roral rop Th team f 1 team f 1 1 reveral them from those properties of 1 agricus f prima fpo y ur ry h fill A the tim the ment of he poet reteated he team it can be the first harmy I sly

- 3 In the hope that should amputation eventually become necessary it might be per formed at a lower level and a healther stump be obtained in the presence of enhanced collateral circulation.
- 4 In the hope that the increased circula tion after ganglionectomy might help to lessen the likelihood of anaerobic infection

Trauma to the great peripheral vessels may be of four types (1) that in which the vessel is so severely torn that loss of continuity is mevitable (2) that in which the vessel is so damaged that repair by suture is possible with re-establishment of continuity (3) that in which the wound has led to thrombosis of a vessel with or without actually perforating its wall (4) that in which the integrity of the vessel wall is not impaired but in which severe spasm of one or more vessels occurs as the result of trauma to the extremity. It will be understood that the element of spasm may be pice ent in types 1 to 3 as well as in type 4

We observed that paravertebral block with procaine was frequently used as an adjunct to the treatment of major peripheral vascular wounds The rationale of this procedure is fundamentally the same as that for operative ganglionectomy viz that by abolishing sympathetic vasoconstrictor impulses max smal vasodilatation of the lower extremity is accomplished and the collateral circulation is thereby enhanced. It is also a well estab h hed fact that procame block of the lumbar sympathetics is an appropriate means of eliminating vasospasm. We feel that an effective procaine block repeated at the cus tomary 8 or 12 hour intervals should suffice in management of wounds of type 4 mentioned and also in wounds of type 2 in which a satisfactory repair of the vessel has been secured and blood flow distal to the suture line demon

strated at the time of operation. We have had no experience with wound of type,

It is in wounds of type 1 however in which there is injury to the vessel which necessitates permanent occlusion (h<sub>a</sub>uton) that we feel ganglionectomy may prove most useful flere we are dealing, with the loss of all or a part of the major blood supply to a limb in addition at times to an associated vasospasm. The early establishment of adequate col lateral circulation is imperative if the limb is to be saved. We feel that if an effort 1 to be made to save such an extremity all possible means should be employed and ther should be no temporating or half measures.

Gan lionectomy was elected as the procedure of choice in these cases for the follow

in, reasons

r The beneficial effect of paravertebral block with procaine is transitory and the in jection must be frequently repeated

2 Technical difficulty in obtaining ade quate block with procaine has been encountered with failure to obtain the desired effects in some cases. The same may be said for alcohol meetion

. We believe that gan lionectomy serves as a prophylactic measure against throm The debrided missile wound must be left open. The vessels can at best be protected only by hohtly suturing the fascia over them further closure is contrary to one of the cardinal rules of war surgery Vessels which he near the site of the wound but which have been spared and upon which the survival of the extremity may depend are su ceptible to The danger a probably greater thrombosi in the presence of an open wound than it would be if primary suture were possible should sepsis occur the threat is increa ed By reason of its increased volume of flow a sympathectomized vessel i less likely to be come the site of thrombus than one not so denervated Should a surviving major vessel become occluded collateral circulation in the sympathectomized extremity will be more adequate than if operation were not done

4 If paravertebral block is employed re peated injections may be necessary in pa tients who are desperately ill with associated thoracic abdominal or head injuries. Move ment of these patunts to and from the per tine, tent is likely to precipitate bock are hould be avoided it it is possible particularly in the early po toperative period. The presence of a plaster pica for concurrent fracture in some cases makes paravertebral block impossible. Furthermore the procedure of paravertebral block is technically most difficult to perform with the patient on a low cot in a crowded ward tent.

5 Even thou h the difficulties enumerated in paramaph 4 are not always pre ent the surgical removal of the appropriate lumber sympathetic ganglia is advocated because it if the only certain means of obtainin the desired effects.

Our experience has convinced us that gan glionectomy is a feasible procedure even in the severely wounded We have had no mor tality and no morbidity attributable to the performance of lumbar sympathetic an lion ectomy The opinion has at times been ex pressed that the severely wounded battle casualty 1 a poor risk for extensive s rgery and that in face of prolonged procedures these men do not survive. Our observation bas been to the contrary both in wounds of the extremitie and in other types. We feel that di aster i more likely to occur from incom plete sur er, than from more prolonged but the ough pro edures. The severely wounded oldier given adequate and continuing shock tre tment and expert anesthesia will survive procedures of considerable magnitude and duration. We are strongly opposed to the school of thought which urges the surgeon to get the patient off the table before he dies The fear of a death on the table may lead to hurried and madequate operations. The sur oers must be complete otherwise the patient may be lost from complications which might have been prevented

E ht lümbar sympathetic ganglionectomics for acute vascular nijunes of the lower extremities are reported the total number that we have performed up to the time of this writing. In 6 cases amputation subsequently became accessary. The other 2 patients achieved sound normal less On the basis of the c results one can neither praise nor condemn the procedure as used for this type of injury We intend to continue its use in the effort to determine definitely its place in the management of acute vascular wounds A larger series of cases and knowledge of the ex perience of others may yet prove its usefulness

# CASE REPORTS

CASE I Cvil n ged years W nded by h nd grenad at 3 30 p m D mber 9 1943 He brought t the fild hosp tal 2 hou s ft rinj ri

A bully p es re d es 1 g had be n applied to the ght gr in p rt all contr lli g hemorrh ge E am 1 at on sh wed s pe fic al ounds of the abd mmal will and ight liverig nd a 3 cent m te p ne t t gwound f the ght gon f om which there we actie bled ng. The pt t as in me led e ethismic shick pal and with un ht mable pul nd blood p at Du gadmin tat n of bl od nd pla ma the hock tent hem rhage fr m the gon hecam sop of s that th p t nt a an thenzed hy pen dr p eth and th vess have climpd. The calf wind tense. At n tum wis

yp hat nf it in the a ter of the f ot aft niti I shock tr tm nt the anesth ti d pt twa tak ntoth p tngt nt Op t n pt twa tak shoch p tngtnt Op t n nm c daty 3 pm The imo i rt v 5 ind to h cmpltly ev ed but nch blow the good the pointed This tates at y wa nate nd p ls ting The im i trw was gat dwh hi. Th i mo i vin was complely v dat hi e i the 1ga I the p inda h ch ad b ends e 1ga I dwith shil. Th fo guhod, which lay in the egon frebpjont

wanot found The the wunds wedhald Rght lumba p avert b I block wa d ne d t buting cab c t met rs f p ent poca e in the g n i the d 3d nd 4th lumb rg gl Th i tw warm pink a d dry at the end of the p t A the nt lg A hulky c tt n d es g vas applt d t The fllowing in any theig adf tetll ap

pea ed vabl At 3 m ght l mha sympa thect my was d e thr ugh th pp ach ad cat d by Sm thw k and the dand 3d g ngla the there g has we emod I ll g p nduti cuatin day it th ght f twasdy dwam thuth lit

This was our first case. The child was practically exsanguinated when first seen liter the beneficial result of the paravertebral block was observed it was felt that sympa thectomy should be done to give maximum possible re-establishment of circulation The possibility of thrombosis of the femoral artery lying in an open wound susceptible to infection was con idered a further indication It should be noted that the calf was not tense

Case 2 American's lde aged 5 ye ust cd gunsh tw nd trroo am Decemb r 0.13 He an ed at the fild hospital about I h r afte found to ! n sever mury One mi tinh sh ch. He had a p forat ng ound f th huttock and a sm ll p n t ting w und n the r gi n of Scarpa triangl n the r ght The popl t al and dors lis p dis p be on the right were un btainable The calf was not tose A ay examination ho ed a f ctu e of the coccyx and a bullet near th head of the ri ht femur On d g tal examinat nat a of the ectum vas found

At 11 45 pm ope tion as commenced A loop sigmo dostomy was don and stens ve deb idement I th butto k wound was pe formed th closure of the r ct I tear and r section of the coccy femoral try and vin we expect at the prof nd rea A hematoma in the vall of the artery was evac ated by longitud al inci i n h ch w

then d ed The ad entit wa tripped f om the all f the a tery f r a d tan e of 6 inches as to pe f m pe is te isl ympathectomy P hat ons dist I t th p of nda h nch The leg was p t n

e tens on a L ller Blake spl nt

On D mh I t was noted that the f ot cold and blanched and the d real pedes p is was n t palp bl A g ngl on ctomy wa adv sed and n t pain of A g g of or comy wa advesed and p formed at 8 pm The Smithw k approch us d and fo nd part c la ly c nv ment b cause f th pr s nc of the lost my The d and 3d g ngl v th unterv ing n e re em v d Follow ng op at n the was no d c ihl change

the ppea no of th f ot

On D cember 23 the lg \ a m to th ank! Th pati nt wa hut the fot rma d cold evac at dafet dyslat with timp ov m tin th circul t nof the foot On ] a y 5 944 g e al hospital a g li tin lower leg amp tation wa d ne l v ngat bial t mp of abo trinch

In the light of subsequent observations we feel that sympathectomy was performed too late in this case to be of maximum benefit The procedure may have saved the knee It is possible that this man suffered embolism from the traumatized femoral artery

CASE 3 Am can sold g d 2 years was ound d n a ton by h ll fragment at 400 pm
D c mb 23 943 H a rved n the field h p tal
h t 3 h urs fter und g Wh n first en h wsn m kdd grefshck Blodpesue and plw tmpcptbl Theewa smallpn trat gwou lin the upper p rt on f the ight thigh nt ly A to rn q t was in place and wa ad q ate t ntr l hem h ge wh h had ppa ently ben m ts Shok th appy the blood a deplasma ws mm dately instituted Me det il d

min t n of the r ght leg r vealed that th calf was fim t ns nd tend even tho gh th e w s no wo nd h low the goun and his ni ry w sonly



We believe that sympathectomy perhaps saved this extremity It is to be noted that the calf was not tense The case was favorable in that operation was performed 8 hours fol

lowing injury CASE 6 Am can old r aged 23 } rs vas

unded in a t n by art ll y fragment at 3 am March 6 944 H w adm tted to the field h pit lapp mat ly 4 hours afte injur, E am tion d's losed th't he had multipl' penetrating

nd f the right thigh and leg I ft rm and leg d left he t wall The right calf was t use and the fo tw p beless How the f twas not bl nch d nd though ol then the left was not ton ld There was n f ctue. The p tint

w sn tins esh ck

nd was

Ato soam Ma h 6 perat n was ndert Len Il w nds eed bid dand lif gn b die re mo d The ight fem late y was fund to be df bout the fourth of the comferne not slot the d and ut e was not fasible be c us f th ext nt f the t um. The rt ry was d d d and l gated with silk. The f mo al in was intact nd as n t l t d. The fot was e ld and bl ached at the ad I this p cedur A ght lum b) nched at the nd thus p codur. A ght hum bg l t nw s then pef m d the gha l t l t p t el g d nc n Th d ad ad g l n t el g d nc n Th d ad ad g l n t el g d nc n Th d s t el g d nc n Th d s t el g d nc n Th d s t el g d nc n Th d s t el g d nc n Th d s t el g d nc n Th d s t el g nc n t el g n a ptt dem fth ski The adw The ws den e f gas g ng n At 400 pm p c d la gull tine amp t ton f the ghtlg a ca d ut S b q t t amp tat the pat t d d w ll

This case should be compared with the pre cedin" Both were seen relatively early The injuries were similar and at approximately the same level \either patient had lost an extreme amount of blood. The outstanding difference was in the pre ence of a tight calf in Case 6 We now feel that the addition of a fasciotomy might well have saved the leg

t d mp

CAE7 5 Id g d 1 d by hllf gm t t 400 a m Jan ) 4 044 0 a al t th fild hosp tal m h rs l t h asfult b ff gfm peftg ul fth l the fth right thigh the ma p nd comm ut df t fth fm H w in mid h ck nd va not ble d g H g ne al

condt n was descrh das fir No not was mad c cernin pulses f foot r c nd ti n of calf

At 60 pm the same dy op at on was p f med Wond of entry and e it v r débrid d The w el wer app ently n t viual z d A T hruk typ splint was applied and immed at ly splt w d ly because fl ck of c c lation in the foot The po tope ative d agn 1 was c mpound com minuted facture f the right femur 1 its I we th rd with possible damage to the vess is of the

On J naary 5 t 800 p m v we easked to see th p to nt i consult tion H as c mplain ng of sever p n in the lower 1 g Th 1 g vas n a widely plit Tobrus spin in N pul erep justo in the fit The leg f m m dealf to t es va mottled cy note nd ld At rosp pm s me at hous ft jury nd 28 hours fter th fit peat n a rght lumb r ga gl on ctomy w s d ne thro gh grider ances n in the low q ad nt In th in terval bet cen the first p at n and ymp thec tomy he had bad the lumba para ert b l n voca my tons with n pp cut benefit Th sympath ct my w app ently of n val and n J nua 3 3 md thigh amp tat n a don just by the fra tu ste It as n t d that the fem oral try and thr mb sed at th s te of Vi amout tion but th tellat leclat n wa will de I ped Co rse fter amp t tio was ev nt flad n l buary 4th ; t nt

We believe that sympathectomy this late following injury is of no avail. When patient was first seen the damage was irreparable and loss of the leg mevitable Under these cir cumstances in the future we should not per form sympathectomy

Case S S ld g d g y ars s o d d by tll ry f agment t 500 m M y 6 944 On In the fild h pt lh I und the will be multiple pen tat gods fthe ight and dig mp under mm nut df et fthe ight hu f the 1ght hu m ru nd c mp nd c mm n ted f a t es f th r ht t b a nd th b la Ther mp rred 1 c la tin n th r ght fot the m mb as cld d tyan t distal to 1 h t 4 ches abov th L! d ther e no p 1 s palpable

At 300 am Mv7 ll nd wer dbrdd I plat h de stws ppl df th f ctu f th ght hum us Ac cul plast wa appl d t th ght l g f om t es to m d thigh l t was n t d that after ppl at n f th pl ster th c culat n n f t mp d L mb mp th t c bl k was nit type d Lmb mp th to bl kwas
cust db tutdu wh c latin mp ed
At copm My 7th to fthe 1ght fot e
I ndt b hin h Th d talp rton of th 1g as m till cyanotc and cld dn pls
pent nth fot Thelf stns Ihptet
hdhdtwlmb paaetbi ) tins ipo ne me h first op at on It was de ded to do symp th ctomy and this w pef med at oo pm by til zing the lo er q ad nt grdir n in csio. No benefit as n ted f om the preedur ht 500 pm. May 7 gas g gen was f nd toh pese ti the leg a d a m d thigh mputat n w s done unde ether.

Folloving amp tat ec very was g d

The remarks made in comment on Case 7 apply equally here

Case 9 Briti hofficer ag d 6 v ars w nd d by a spent mach n g n h ll t tooo N cmbe 9 943 ecel 1 penet at g ound of the left thigh At the t me he was wound dh had b nlvng namuddy slitt nchfr48 hrs ith t food d i th t t m Sh rily after receiving the bullet wound he b t that m by a hand g nade which hurst cl to bis trench dea sed ap trating wound of the ri ht ye He lay where he as hit f r about 4 hours He reach d the casualty cle ang tat n som 34 hours fte bei gfirst ounded Atthatt m h was midly acidotic in slight shock (b) d p ess 100/7 ) and not ble ding A m Il pen trat ound as present in the med portion fith lift thigh poster ly The misil was pip his becut nouly to oly Pubes wr pes nt a foot Ope at n a per med t 8 cop m n h m brio Th foreigh dy in thilg as m e try as enl g d and débr ded Th fem as to n but the arter, was t t The 1 n was I gated ith silk The try as vis bly d p l pably in marked pasm. If we ver f hie p bat ons t come th ough and th spasm t t th end f the ope ation Du th pe t n th e vas diffculty ntrolling hl d en and a odng i jury t the i tact a terv a d scite ner e The pat t lost ns d hl q tty of blod a d eq d th adm i t n f bl dand plasma d ng th op at n Wh n th pedure as complted ap veth lp can i jet on of oc bece t meters in th gnfd ths m wa mng a dad l mbr g ngla as d ths m wa mng f the cali res lt g b t n p bes we p lp bl n the f t ling n r l nd t n pp df ril g d ph wa 3 b t fg do ltv dbl dpes n m l thetme f t nt th w d

At mideth of third, of herath and I plee a g d I hithe a sould be controlled to the controlled t

A tops as nf tu tly tpo M H my ha d dof blast nj yd t th rv l plos n f the b dg n d H h d t rm l a ra nd death myh b d t transfus n

ction. It is c t in that he was in a m epr cross physological state at the t me of operation than was fully app enated a d the ghb was co peted when the operatin was stated took the los of only a elatively small amont of blood to peep tat shick durn the procede

The effect of paravertebral block in the patient was definite though not completel satisfactory in that restoration of circulate to the foot was not effected. It is possible than the not suffered from severe peripher vascular collapse repeated lumbar block mught have permanently relieved the artist spasm. Repetition of the block or sympathet tomy was contemplated the choice between the procedures to depend on the condition of the foot 8 hours after operation. However, the patients collapse demanded that al efforts be directed at saving his life. This were unfortunately, not able to do.

# EVALUATION

In reviewing these histories it becomes ay parent that in Cases 7 and 8 too much tim was lost between injury and sympathectom for the latter to be of benefit. As the sumaries of these 2 cases show the lower leg is each appeared nonviable at the time of gallonectomy. If sympathectomy is to be done it should be done as early as possible that at the time of the original operation for thinguries. From our experience with these cases it would seem hardly worth while temploy sympathectomy in patients in who the limb is already clinically nonviable.

A condition, commonly seem in lower et

A condition commonly seen in loner et tremities with acutely impaired circulation is the so called tight calf This condition was observed in 2 cases (3 and 6) In neither were the wounds so situated as to cause hematoma of the calf It is thought that tight calf is due to a cloudy swelling of the muscles due to anoxia The condition can arise early (Case 3) We feel that in such cases one may postulate that sympathectomy without extensi r lower les fasciotomy is useless Unfortunately we failed to employ fasciotomy in these 2 patients Whether or not the legs would have survived had we used a combination of sym pathectomy and fasciotomy we do not know but we strongly urge a combination of the two procedures and intend to employ the combination in such cases in the future. Tense calf muscles are seen sufficiently often so that one should always examine the lower leg in these pattents to determine the presence or absence of tension.

In wound of the lower leg hematoma frequently comprises circulation distal to the point of trauma. Extensive fasciotomy with out sympathectomy has been employed by us nuch cases and found sufficient to save the leg even when two of the three major vascultion of the patient with such an injury has permitted the use of spinal anesthesia we have felt that the temporary interruption of vaso constrictor impulses has been beneficial. This property of spinal anesthesia should be kept in mind and its employment in carefully se lected cases may prove advantageous.

We believe that certain indications for the performance of ganglionectomy may be pro posed The possible benefit to be derived from the procedure should be considered in the management of any traumatized extremity presenting evidence of vascular impairment Points to be searched for in examination of the patient are the absence of pulses in the foot and popliteal space a leg colder than the normal one blanchin cyanosis or mottling of the foot or leg early loss of cutaneous tactile sensibility and the presence of a to ht calf. The presence of any of the fore going conditions should serve as a warning that serious vascular damage exists and usually several of them will be found in the same extremity. The presence of tight calf we believe to be of particular si nificance in dicating as it does a serious degree of anoxia

Given any of the physical findings mentioned it is imperative that at operation upon the wounds the surgeon visualize and completely understand the exact nature and extent of the vascular injury. In the majority of patients presenting the signs we have mentioned either direct injury or severe spasm (or both) of a major vessel is almost certainly present. If damage to a major vessel is found in a patient presenting these signs we believe that sympathectomy should be done. If spasm alone is found paravertehral block

should first be tried and may well prove ade quate. Should the patient's other wounds make it apparent that repeated blocks will be arduous for him sympathectomy should be done at the first sitting.

We believe that the patient's chances will be favored if ganglonectomy is done in all wounds to the iliac femoral or populteal arteries and in potients with wounds of the thigh who present a tight call. Sympathic tomy should be considered as a prophylactic measure in dealing with wounds to major vessels (e.g. the superficial femoral artery) if the circulation is not grossly impared.

There are certain contraindications to gan phonectomy It will obviously serve no useful purpose in limbs so severely traumatized that primary amputation is necessary. If the nations is seen late following wounding the likelihood is that sympathectomy will do no good In general if a limb appears nonviable and changes are at all advanced with a beginning line of skin demarcation sympa thectomy will probably be useless Our earlier hope that the operation even in these cases might save a part of the limb and make pos sible a lower amputation has perhaps been borne out in 1 instance (Case 2) In patients in whom the time element is borderline it might be well to perform paravertebral block and base the final decision for or against gan ghonectomy on the obs rved effect (Case o)

It will be appreciated that great attention to detail a necessary in the handling of the type of injury under discussion. The dressing is particularly important. We have found that a satisfactory method of protecting an extremity with precanous circulation is to wrap the member in an extra thick layer of cotton from toes to groin and to incorporate it in a light circular plaster cast with a firm posterior splint. Then the entire cast and padding must be bivalved. Examination of the leg can be made simply by removing the top shell. The object of such a dressing is to give an even distribution of pressure and thereby prevent pressure points and necrossi

A word should be aid with regard to the use of dorsal sympathectomy for injury to the vessels of the arm. We have seen no case either of our own or of our associates in which

this procedure appeared indicated. As one would expect the collateral circulation in the arm is practically always adequate to assure viability (e.g. Case a). Fatients we have seen with vascular training sufficient to jeopardize the limb have all required amputation because of the extent of the damage to other parts. A rare case may be seen in which this condition is not so and for this dorsal ganghonectomy should be kept in mind.

Two pomits must be finally emphasized First gan, lonectomy to be of benefit must be performed early it is probable that after 24 hours tissue damage is irreversible. Second ganglionectomy is an adjunct only in the management of these wounds. Thorough dehridement with meticulous care for the structure involved complete visualization of the pathology and attention to detail in dressing are imperative. Supplementary procedures must be performed as indicated fasciotomy for trich tail finally be cited.

# TECHNIQUE

The rationale of the operation of ganelion ectomy lies in the fact that when the central vasoonastricot impulses to a vessel are in terrupted maximal relaxation of the acterial smooth muscle results. It has been further demonstrated that the most permanent and complete results are obtained by a procedure which interrupts pregan home fibers only. This is accomplished satisfactorily in the case of the lower extremity by removal of the second and third lumbar sympathetic gan, ha (i)

We have employed an extraperstoneal approach to the lumbar gan listed chain in all cases. Three were done through the flank approach advocated by Smithwick the others through the flare, el lower quadrant godinon in cision of Lenche. We have found that the approach of Smithwick is most convenient in small patients and in those in whom the presence of other wounds made the gridinon in cision impractical (Case.) It has been found however that if one does not have available certain instruments particularly Deaver retractors longer that those in standard use by the Army Crite hereve hooks Hart

man forceps Cameron light and a lon dura clip carner that the operation is technically difficult due to the depth of the vound lit also impossible to place the patient in optimin position for the approach on the operation tables available in the field. Therefore we vocate the lower quadrant gndron incision for the usual case done in forward hositistic.

The transperitoneal approach which as have not used might prove the most fea black not used might prove the most fea single the term of the most fea when the single the term of the most fea when the missile after penetrating the group perforated the right external ulac attery and passed upward causing exten its useral dama e. Tran peritoneal sympathetion, through the laparotomy incision would have been performed on this patient had he survived his massive hemorrha e and intra peritoneal dama's

#### STRIMARY

It is our opinion that lumbar gan honec tomy if it can be performed early should be considered in the management of wound from the bifurcation of the aorta to the bifur cation of the popliteal artery which reopardize the circulation to the lower extremity. The real test may he in its u e in cases of severed populeal artery for very few extremities sur vive with injury to this vessel Presence of an intact profunda femoris artery in the face of loss of the superficial femoral has been found to be no guarantee of the viability of the et tremity Collateral circulation of the lower leg has been found to be sufficient even in the presence of ligation of two of the three major It is felt that ganglionectom, will be less frequently indicated in injuries to vessels of the lower leg than in those of the thi h

It is our hope that this paper will stimulate the interest of others in the use of gan honce tomy as an adjunct to treatment of wound of the major peripheral blood vessels and that their results will be reported Thereby the true value and place of the procedure in treatment of this cla so if wounds may be established

REFERENCE

Summer R H N E gla d J M 94 699 J

# ASEPTIC GASTRIC RESECTION

# ALFREDO MONTEIRO M D Rio de Janeiro B il

TEARLY forty years clapsed be tween Souligoux s proposed tech mque of gastroenterostomy and the present method of gastroe resction with closed asseptic anastomosis. The latter has been advocated by Wangensteen Babcock. Totten Holman Weinsten Emer son Neuber and Montero

It is interesting to review the technique which avoids opening the stomach and intestinal cavities at the time of anastomosis

Briefly stated it is as follows

r With a special forceps the portions of the stomach and intestine where the anastomostic opening is to be made are crushed This erushing traumatizes particularly the mucosa and muscularis and has the least effect on the scrosa

2 Caustic potash is applied to that portion of the gastric and intestinal serosa demar cated by the blades of the forceps

3 A scromuscular suture is made around the crushed and causticized area. After 48 hours when this tissue sphacelates the anas tomotic opening is sealed off without con tamination by coalescence of the serosas held

in apposition by the sutures

Gudun Wadhams Luquet and others have contributed much to the development of asepte gastrontestinal anastomosis Wadhams and Luquet advocated electrocoagulation of the walls of the stomach and intestine followed by scromuscular sutures around the electrocoagulated area such that when the eschar separated there was already coales cence of the scross and the opening was established without contamination. This is essentially the principle advocated by Souli goux

Closed intestinal anastomosis has been popular since Dopen in 1897 in an effort to effect hemostasis established the principle of crushing the intestine in order to close it aseptically. With his angiorithe the intestine was reduced to paper thinness. With his

From th D vi [Surgery L ty [Braz ]

procedure contamination from intestinal contents was avoided and its use was advocated in end to end anastomosis ligating the crushed ends bringing them to apposition with seromiscular sutures cutting the ligature with scissors introduced through the opening just before completing the encirching sutures.

The method of Doyen was followed by various means of closed anastomosis differing only in minor details. Some surgeons have given preference to anastomotic clamps oth

ers to traction sutures

It is not in the scope of this paper to discuss all the various methods of closed intestinal anastomosis. The closed method of intestinal anastomosis was worked out at our clinic while the open anastomosis for the stomach was still in use hemorrhage was feared if the mucosa was not sutured. The few immediate and late bad results were accepted because of the 80 per cent good results.

In 1918 Gudin in discussing asepsis and hemostasis of gastrointestinal surgery ported his first failure in aseptic gastrectomy In 1939 and again in 1941 Gudin presented in Rio de Janeiro and in Buenos Aires motion pic tures illustrating his technique of gastrectomy with closed anastomosis Before the National Academy of Medicine in 1943 he presented a paper in which he brought forward the value of what he termed lamination sented his own instrument which he helieved insured hemostasis and at the same time he emphasized the importance of using traction sutures as recommended by Pauchet instead of anastomotic clamps He believed that his method was a further improvement in gastro

Since 1935 the you I letz (5) suture instrument has been used in our clinic to close the duodenum in gastroenterostomics and also to close the large bowel after surgery. In typical subtoal sustaination of Rei chel Polya as developed by Montenegro has been continued. When the you Petz suture

intestinal surgery



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instrument is used the technique of Hoff meister Finsterer 1 followed the cip from the sement of the stomach to be anastomosed are removed and the operation 1 finished by the open method

In the beaming of 1043 the technique to be des ribed has deised. It was decided to apply the clo ed method of anastomo is in gastine resections for the following reasons (1) the reliability of the closure of the von Petz siture instrument () the as urance of hemostasis by electrocoa ulation (3) the good results of (2056 aseptic anastomosi in bowel

surgery (4) the sood results obtained in our experiments in do s and (5) the opinion of other experimenced surgeons voiced in recent publications—Wan ensteen Babcock Tot ten and Holman

In 194, 2 gastincre ections were performed by the new technique in Buenos Aires. After witnessing, the operations. Prof. Galirdez remarked that the technique was revolutionary. It is our opinion that it is evolutionary rather than revolutionary, because it merely advances one more step the technique of closed anastomo. To the gastronitestinal tract. It



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is my belief that the present technique of anastomous insures acepsis simply because the sutures do not pass through all coats Sutures that do pass through all coats act as drains from the cavity of the gastrointestinal tract into the subserosal space

The absence of edema about the anastomo sis eases the postoperative course to such an extent that there is no need for the employment of the Abbot Rawson tube. It is impres sive when the postoperative course following this technique is compared with that follow

ing open anastomosis

While the perfect method of aseptic gas trectomy has not been developed we do ap pear to have arrived at a safe technique that brings excellent results. On the hasis of the results in a ocases in which patients were carefully followed it is believed that this new technique can be recommended. It is possible that further improvement in technique will include the use of a special insulated clamp that will permit the employment of an electric cautery after the completion of the seromus cular sultime.

Another problem we hope to solve 1 how to deal with terebiant duodenal ulcers while



Fig 5 The pyl diffest mehisped the trubbe cap. The Mits wg 1 mp bappled the timeth. The telebrate the timeth to be telebrated the trow fMitschps.

adhering to principle of closed aseptic surgery. Up to the present time submucous separation has been done according to the method of Montenegro which seems preferable to the technique of Nissen. This very interesting subject will be discussed in another article which is soon to be published and in which will be considered the question of whether or

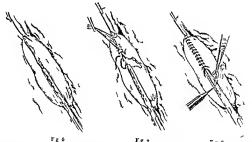
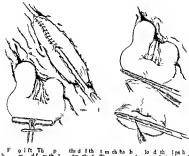


Fig. 6. The Mit pecual lamp is policed to be good before segment the time but g g t be ansat me sed by pring the part to this J. um Fig. 7 Clear for the difficult to be to reme education before the first terms and the best terms are the best



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not terebrant ulcers of the duodenum should be removed and also how to proceed with this step without interfering with the aseptic technique

# TECHNIQUE IN GASTROENTEROSIOMA

The blood vessels of the greater curva ture are ligated either above or below the great arterial circle in case an ulcer is present and always below in case a mah nant growth is present

2 The pyloric and gastric arteries are tran fixed and doubly heated

3 The duodenal stump is closed in the following manner

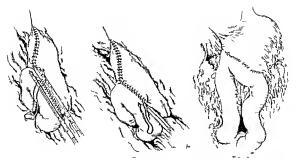
a The stump is crushed with De Martel's clamp and tied with a temporary heature that is cut with Barreto's guillotine after the stump has been inverted by means of a pursesting suture

b A von Petz (5) clamp is applied fol lowed by inversion of the stump with a pursestring suture or with the Halsted's quilt suture TECHNIQUE IN GASTROTETUNAL ANASTOMOSIS

After the von Petz suture instrument is applied to the stomach at the level to be removed the clips are compressed and a special clamp of my own design is applied just above the proximal row of clips. By means of an electric scalpel the stomach is severed be tween the two rows of clips thus remova the dit all segment. Two types of clamps of my own design are used the larger one for the Hoffmenster Finsterer type the latter bem preferabl. The clips remain on the portion of the stomach which is not to be used in the anastomosis and are buried with Halsted's oult suture.

A jejunal loop about 20 inches in length is selected for antecolic anastomosis. The portion to be anastomosed is crushed with the Tlammator clamp of Gudin then removed

and one of my own clamps is applied. The jejunum is approximated to the stomach and under the clamp the posterior seromuscular suture is made. This suture begins at the



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base of the clamp and extends up to the tip of the clamp. The excess of crushed jejunum is removed and also the distal row of von Pet. s (5) clamp finm the stomach

The cut edges of the stomach and pejunum are hightly electrocoagulated. This done the seromuscular suture is continued around the tips of the clamps and above them until their base is reached. At this point the clamp is removed and the suture is completed by closing the fenestration which has been caused by its removal.

The efferent loop of the joudum is then buttressed over the suture line of that portion of the stomach not used in the anastomoss \( 1 \) few reinforcing interrupted sutures are applied at the angles and around the circum ference of the anastomosis to complete the operation. The anastomosis is made patholous immediately by the employment of the thumb and forefinger from the outside.

#### COMMENTS

The method of aseptic gastric resection here de cribed has been found most satisfactory. With it it is possible to avoid filiform.

drainage along the sutures from the mucosa This drainage with contamination is inevitable if the sutures run through all layers of the stomach or bowel

The von Petz (5) and similar clamps have been found most useful in carrying out the procedure but they can be dispensed with when the electric scalpel and the so called laminator the crushing clamp are used Slow and gradual crushing alone even if pro longed for one hour does not guarantee hemo stasis

That certain terebrating ulcers are not satisfactorily handled by crushing should not prevent the use of closed anastomosis where indicated any more than should the occur rence of perforated ulcers. Nor is one justified in my opinion in advocating open resection for gastric ulcers and closed anastomosis for caremona.

#### SUMMARY

An improvement in the technique of aseptic gastrectomy is described. The technique has been used in 40 cases of ulcer with i death this death was not the result of faulty technique.

The technique described might have been adopted earlier had I not felt satisfied with 80 per cent good results and fear of hemor rhage Only after becoming confident of hemostasis by crushing and electrocoagulation or ligature of the submucosal vessels through experiments on dogs was the decision made to abandon the mucosal suture and to adopt this new technique

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# SUCKING WOUNDS OF THE CHEST

CHARLES STUART WELCH M D FACS Leute t Colonel M C AUS Albany New Yo k d JOHN E TUHY M D Capts M C AUS Ford d Oregon

TUCKING wounds of the chest are met commonlyamong the seriou lywounded casualties admitted to an evacuation hospital While they are encountered seldom in civil practice and infrequently in military hospitals not in the field we believe that our experiences in dealing with them may be of interest to surgeons engaged in war sur gery in forward hospital units and to others doing secondary thoracic operations for the late complications This communication will deal with the preoperative operative and postoperative management of patients with open wounds of the thorax up until the time that those who recover are well enough to be evacuated to the rear This echelon of surgi cal treatment is today a field in itself. Only the immediate results can he presented since the end results in this group of cases cannot be known for some time

During a 3 month period 70 patients with sucking wounds of the chest were treated in an evacuation hospital during a very bu-y period These patients represented 8 1 per cent of a total of 8 o casualties with injuries of the thorax Of this group 315 or 36 7 per cent were known to have hemothorax pneumo thorax or both This figure undoubtedly would have been larger if cond tion had per mitted more complete study. The progres sively increasing dangers as ociated with open pneumothorax however made the sucking wound group the greatest problem Shock mediastinal flutter with interference with car diac action anous from ineffectual respira tion loss of body fluid and heat and infection of the pleural cavity are some of the particular hazards encountered

# DIAGNOSIS

The diagnosis of an open chest wound had usually been made at a forward installation

From th D p tm t I S ry Alb Medical Coll g Albany New York and th D partm t I The race Surg ry Lm rs y St t T berculosis H p al P tl d Oregon. and an occlusive vaseline gauze dressing with tight adhesive strapping applied. In some cases however the diagnosis had been missed and a sucking wound would be found under the original blood soaked battle dressing. In only 1 of our cases had emergency suture heen performed and incidentally this proved to be ineffective A properly applied vaseline gauze dressing was nearly always adequate On admission of patients with chest wounds an inspection of the dressing was made at once on the shock ward or in the preoperative wards and the patient was asked to cough unless the diagnosis of open pleural communi cation was obvious A gush of air or blood on coughing occurred in positive cases not previ ously detected A good occlusive dressing was then applied

Of equal importance and perhaps of more importance than the diagnosis of the open pneumothorar is the question of the diagnosis of factors complicating the picture in these patients namely the presence or absence of shock severe respiratory or circulatory em harrassment hemorrhage from the lung or chest wall injury to the mediastimal or ab dominal organs and injury to the contralateral lung. Moreover the surgeon is interested in the number and location of fractured ribs and foreign bodies and the extent of any associated injuries which in themselves influence the various decessions he must make

## CLINICAL FINDINGS

In our group of 70 cases 48 wounds were the result of shell fragments 18 were incurred by machine gun or rifle bullets and in 4 the type of missile was not stated. In 49 instances the wounds were of the penetrating type in 20 they were perforating 1e through and through and through and there vas 1 gutter type of wound. Fractures of the ribs or costal car tilages were known to be present in 44 cases 20 of which had multiple fractures but the true figure was probably higher. In addition

fracture of the clavicle was seen in 3 cases and fracture of the scapula in Right sided wounds were nearly twice as common as left sided 45 of the former as compared with 23 of the latter Presumably left sided wounds were more frequently fatal on the battlefield In 2 patients there were bilateral sucking wounds and in 4 there were 2 sucking wounds on the same side Shock was present on admis sion in moderate or severe degree in 37 cases This figure would probably base been higher had not many cases received from 1 to 4 units of plasma and in a few cases blood transfusions as well at forward installations Severe shock was of course more common in the sucking thoracoabdominal wounds and in large thoracic wounds with considerable bleeding Slight to moderate dyspnea was present in two thirds of these patients most of whom required oxygen and there was severe dysp nea and cyanosis in 9 Wound hemorrhage was severe in a cases and was important not only because of the blood loss involved but also because it was hable to loosen the occlusive dressing and re establish the open pneu mothorax All ca es had some degree of hemothorax and pneumothorax but the for mer was severe (estimated at 1000 cubic centi meters or over) in 10 cases. Only 1 instance of tension pneumothorax was found in a patient with a valvular sucking wound at the medial end of the left clavicle Mediastinal emphy sema caused by a small laceration of the trachea was also present in this case. An other instance of moderate mediastinal em physema occurred in a patient with periora tion of the trachea which required closure and tracheotomy On admission to the hospital pulmonary edema was well marked in 3 pa tients 2 of whom died though the condition probably occurred more frequently to a les er degree when one considers the lung dama e and paradoxical respiration commonly present in open chest wound Right sided heart fail ure may be precipitated in such cases by the lar, amounts of blood and plasma used m combating shock especially if they are given rapidly The treatment of shock complicated by pulmonary edema is very diffi uit for the The signif cance of blast injury in these cases is difficult to a sess but is probably

not often an emportant consideration The diagnosis was made in 1 of our cases from the history and by roentgenograms Atelecta was diagnosed from the admission rocat enograms in 8 instances There was homolateral partial or complete collapse of a lower lobe in 7 cases and a contralateral atelectasis of the cardiophrenic egment in the other case is addition den ities attributed to intrapul monary bleeding and to aspiration of blood into the hronchial tree of uninvolved portions of the lung were met with frequently Vod erate to severe gastric distention on admission was evident in 5 cases This complication is to be watched for especially in wound of the lower left thorax Morphine por oning waencountered twice and in 1 case characterized by re piratory depression pin point pupil. cyanosis and terminal convulsions it con tributed largely to the fatal outcome One half grain of morphine tartrate h d been given hypodermically before admission in practically every case and the familiar phe nomenon of increasing morphine effect as the ratient's shock improved was sometimes trou blesome The use of not over 4 grain of morphine sulfate is recommended as the first dose in the average chest tound and no more than 1/6 grain dose subsequently Bilat erri and multiple sucking wounds have of course a grave progno is Two patients not only had 2 sucking wounds on 1 side but also sucking wound on the other hemitherax toth died Two other men with 2 suckin wounds on the same side recovered As o ciated mysti s obviously have reat simili cance especially abdominal injuries (21 cases) severe compound fractures (16 cases) and spinal cord injuries (2 cases) Apart from abdominal injuries there were severe a so ciated injuries in 22 patients and slight of moderately severe wounds were present in many others

# EMERGENCY AND PREOPERATIVE CARE

All patients known to have suckin wound were treated in the hock ward and or, en therapy started if necessary for disprea and cyanosis. Patients were left on the same lifter until they arrived in surgery and some times until they reached the postoperative.

ward The blood pressure and pulse rate were determined immediately and at frequent in tervals as a guide to treatment and promosss Patients in shock without much dyspinea were left flat until they improved then they were propped up in bed Those with dyspinea were more comfortable reclining on a back rest from the outset

A transfusion of stored citrated 1 lood was begun as soon as pos ible in those showing signs of shock and hemorrhage Even if the blood pressure was within norm I limits these patients were known to have lo t blood and it was nearly the rule to give at lea t 2 units of pla ma and 500 cubic centimeters of blood to each patient Early in the campaian the blood as ultered into an equal quantity of normal saline or plasma for greater case of ad ministration. Later more transfusions of whole blood were given especially in cases in which it was anticipated that 1000 cubic centimeters or more of blood would be necessary to lessen the likelihood of pulmonary edema from the administration of too large amounts of intra venous fluids In 27 cases in our series one 500 cubic centimeters transfusion was given before or during surgery in 16 1000 cubic centimeters was given in 4 1500 to 2000 cubic centimeters and in 3 500 cubic centimeters or more of blood was administered Delay of blood replacement therapy until the post operative period in cases of pulmonary bleed ing has been recommended by some but we believed that it wa hest to give these patients relatively large am unts of blood and plasma before and during urgery

The injured side was kept down it there was much hemoptysis or paradoxial motion of the chest due to extense rib fractures. Chest pain on cough or motion or pain elsewhere due to associated injuries was common if more than 6 hour had elapsed since the last dose of morphine. Restlessness was frequent because of pain and anova so that some patches that the properties of the properties of the properties of pain and anova so that some patches that the properties of the properties

rest oxygen blood replacement therapy re clining posture and sedation. Intercostal nerve blocks with x per cent procaine for pleuritic pain have been recommended but none was carried out in our series.

Physical examination of the chest and survey of the patient for other wounds were car ried out a soon as practicable. It goes with out saying that patients in sever shock should be turned as little as possible but examination of the anterior chest may yield signs of hemothorax pneumothorax mediastinal deviation paradoxical respiration and subcutaneous emphysema.

Tetamus toxoid was given to American wounded on admission if it had not already been administered and tetanus antitovin was given to other wounded. The administration of penicillin in doses of 2000 units given intramuscularly every 4 hours was started in all cases and sulfadiazine i gram every 4 hours orally was prescribed every when there was vomiting or suspected abdominal involvement.

Severe or progressive dyspinea and medias timal shift necessitated aspiration of air and blood in 9 of our patients during the preopera tive period. Intubation of the cliest for water seal drainage was necessary in the case of tension pneumothorax mentioned. However there seems to be no reason to aspirate moderate sized collections of air or blood pre operatively in patients who are reasonably conditioned for suggery.

Aspiration of the stomach with a Levine tube was carried out preoperatively for dilata ton in everal cases and probably should have been done more often to decrea e the incidence of vomiting in the period of recovery from anesthesia.

Diagnosis of abdominal involvement may be easy because of the position of the wounds of entrance or exit presence of gastric content or ble in the chest wound drainage hematuria or hematemesis. The position of a retained projectile in the roentgenogram with sixualization of its course is most important in difficult cases. Muscular rigidity and ten derness are tartler unrelial le signs of abdominal molyment since they are common on the wounded side in injuries of the lower thorax.

For this reason anteroposterior and lateral films of the abdomen were always made when any suspicion of abdominal involvement was entertained

When a patient was out of shock and was not uncomfortable out of oxygen be was sent to have roentgenograms made. Anteroposte rior and lateral chest films were made with the patient sitting up if possible. Occasionally it was necessary to take them with the subject reclining or supine and sometimes even through the litter when the patient's condition was poor. In 4 cases of severe perforating wounds it was thought best to forego x ray examination because of the condition of the patients and the obvious extent of their in juries.

While sucking chest wounds had surgical priority it was thought that once they had been sealed and shock overcome it was time well spent to let the circulatory and respira tory mechanisms adjust themselves to the new situation For example we believed that a delay after the administration of rather large amounts of blood and plasma was ad visable before surgery was undertaken since another 2 or 3 hours probably have little effect in increasing the incidence of empyema and may well make the patient a better operative In other instances the surgeon's hand may be forced by continued bleeding from the lung chest wall or liver by the presence of evisceration of the stomach or intestine or by large sucking defects poorly controlled by dressings

The length of time between injury and sur gery in our series of cases varied greatly for many reasons but avera\_cd\_3\_ hours The interval between admission and surgeryran ed from 1 to 36 hours and averaged 10 hours Some delay was often unavoidable of course becau e of the scheduling of other un<sub>0</sub>ent cases

#### ANESTHESIA

In most cases the pattent was transferred from the litter to the operating table and a slow infu ion of blood or plasma started. The pattent was given 1/100 grain of atropine sulfate intra-crosuly, and 1/6 grain of mor phine sulfate as well if he had had none in the past several hours. No morphine was given

to patients in poor condition however lines thesia was induced with a mutture of nitrous orude oxygen and ether with the patient supme or propped up slightly. After insertion of the endotracheal tube he was turned to the appropriate position for surgery. The anesthe tast could now control respiration the dec sin could be safely removed and the skin pre pared for operation. In patients with lare hemotherax or those only recently out of shock turning, sometimes caused a sharp fall in the blood pressure and it was at this state that the anesthetist had to watch his patient more closely.

of the 64 men operated upon 45 received endotracheal ether and another 6 were given an ether oxygen mixture with the anesthe is machine. The former was preferred because of the faculty of controllion respiration in suring, an airway and aspirating blood and secretions during and after surgery. A large endotracheal tube was used without a Guedel cuff or pharyngeal packing about the tube. The positive pressure which could be exterted to reinflate the lune during closure was there fore limited. However air was aspirated from the chest catheter for this purpose in some cases.

The anesthetist preferred to maintain a constant flow of 5 to 7 liters of over 20 m a min us since this procedure seemed to give better ovygenation than the use of half a liter a min use with the closed system. Once the tub. had been pas ed little ether was required and the patient was maintained in the upper plane of surrocal anesthesia. During wound closure and transdiaphragmatic procedures he was been deeper to insure quieter respiration.

Postoperatively the tracheobronchal tree was a pratted with a catheter in mot in stances and in several patients in v hom ther was considerable secretion and attelectass bronchoscopic aspiration was carried out. In a case bronchoscopy was performed before insertion of the tube for the same reas. In Patients in poor condition at the end of operation were kept on the table for an hour of more if this was feasible while the adminited in the not of year and blood was continued.

While the use of sodium pentothal as an anesthetic agent is ordinarily contraindicated

in patients with anoun or excessive tracheo bronchial secretion it was used in combination with nitrous orude and ovygen from the machine in 10 cases. Most of these were particularly amail suching wounds in whom there was little respiratory difficulty. The method wa satisfactory in this selected group and its advantage lay in the time saved. It is not recommended for thoracotomy, however

Three patients were operated upon under local procame anesthesia. One of these had a severe thoracoabdommal wound with eviscer ation of the stomach and large intestine and he was operated upon while in shock, in an attempt to close the pleural and abdominal defects. In the other 2 cases there were small pleural openings which the surgeon succeeded in closing after intercostal nerve block, and local infiltration.

## OPERATIVE TREATMENT

Of the 70 patients with sucking wounds 64 were operated upon and 6 died without sur gery. The operative treatment of this group of patients is divided into the repair of structures in the chest and abdomen and closure of the chest wall and the operations for additional unrelated injuries. Usually all surgery can be done at once but in severely, injured patients it is sometimes wise to deal with the chest and abdominal injuries first and to post pone operations on the extremities spine or bead for 48 hours or longer.

Three principal types of thoracic operation were performed (1) wound debridement and closure of the chest opening (2) thoracotomy and (3) thoracotomy plus transdiaphragmatic exploration of the upper abdomen

Simple debindement of the wound with or without rescution of a fractured rib and clo sure of the thorax was performed in z<sub>1</sub> ca es. This procedure was usually followed by as piration of the hemopre umothorax with a syrin e and large needle or the intubation of the chest for closed catheter drainage. The latter is indicated if a large hemopreumo thorax or established infection of the pleural cavity; present and also if there is su perion that tension pneumothorax may develop. In

of our cases the chest was not intubated until 4 hours after operation when the

wounds began to suck again because of inad equate closure. In 1 instance the lung reexpanded and the wound healed well after simple closed catheter drainage for 48 hours. In the other the patient had to return to the operating room for a thoractomy.

In this group the pleural opening was fre quently small and intercostal rib resection was performed in only 4 cases. Ten in all had senous associated wounds and in 4 patients laparotomy was also performed for abdominal injury.

This procedure of wound debridement and closure of the chest opening without cyflora tion of the thoracic cavity is most applicable to the following types of wounds first to small sucking defects especially intercostal ones where the indications for thoracotomy are not present and second to thoraco abdominal wounds in which the major problem is in the abdomen with little or no lung damage and which usually occur if the missile has traversed only the costophrenic sinus be fore entering or leaving the abdomen. Here a laparotomy may be done plus debridement and closure of the chest wound with intubation\_or aspiration for the hemopneumotherax

There was r death among these 25 pa tents an undication in most instances of the nonserious nature of the chest wounds in volved rather than a recommendation of this type of operation. The patient who died had a large evisceration of the stomach and color through the abdominal wall with a small sucking chest wound. There was considerable hemorrhage with shock. He has been referred to above as one of the 3 patients operated upon under local anesthesia.

The indications for thoracotomy 1e en largement of the existing pleural opening usu ally with resection of segments of one or more ribs to permit inspection and operative procedures within the pleural cavity are considered to be as follows (1) any large sucking wound with fractures of one or more ribs (2) suspected diaphraematic herma or perforation of the upper abdomen (3) suspected continued heeding from the intercostal vessels the lung internal mammary vessels mechastinum or hiver (4) presence of large intrathoracic foreign bodies or indriven rib

fragments (5) suspected wounds of the tra chea bronchi esophagus or heart and (6) clotted hemothorax

After debridement of the vound or wounds the thoracotomy incision is usually made at the site of the sucking wound parallel with the fractured rib A posterior mission like that for a first stage thoracoplasty may he neces sary for posterior wounds of the apex A thoracotomy incision separate from the wounds of entrance or exit is in our experience seldom necessary or advisable.

Twenty three of the 64 cases belong in this second group Rib resection was carried out in 21 of them and in 9 segments of more than I rih were removed. In the other 2 cases ex ploration was done through an intercostal incision After hemostasis of the chest wall and insertion of a self retaining retractor blood and clots were evacuated from the pleu ral cavity and in pection was carried out with the aid of a lighted retractor Lacerations of the lung were sutured in 6 cases Suture was not thought necessary for small lacerations without any bleeding Debridement of the pulmonary tissue except for removal of rih fragments and other foreign material was not performed in our series. Metallic foreign bodies were removed from the lung or pleural cavity in only 3 instances although a number of others were removed from the abdomen and chest wall Unless a small missile (i centi meter or less in diameter) could be easily found no time was lost in searching for it Larger fragments were sought for and re moved if possible and the incision in the lun, sutured Many of the wounds were perforat ing in type and the problem of foreign body removal was not present

Closed catheter dramage was instituted in of these 3 ca es always separate from the thoracotomy incision A No 18 catheter was inserted and sutured to the skin usually in the 8th or 9th interspace posterolaterally or ometimes in the 6th interspace laterally closed dramage is a safeeurad against respir atory embarrassment due to accumulation of fluid and air postoperatively breakdown of fluid and air postoperatively breakdown of the closure and unrecomized acute empema and nonre expans on of the lune. In cases with gross contamination of the pleural cav

ity 60 000 to 100 000 units of pencilla were injected and the tube clamped for sevent hours. In some cases especially where post operative tension pneumothorax is probable it may be wiser to insert antenior and poster nor catheters.

Closure of the thoracotomy incision in lay ers was now carried out beginnin with the panetal pleura and periosteum to ether with the intercostal muscles It is advisable to have at least a two and better a three layer muscular closure Pedicled muscle grafts from the chest wall muscles were often sutured into the pleural defects which had not been com pletely closed with the first continuous double suture of No chromic cateut Additional muscle layers were then closed with inter rupted sutures overlapping the first closure Pericostal sutures were used a number of times These were most useful in drawin to gether intercostal incisions but were not necessary in our experience when rib resections had been performed. The subcutaneous to the and skin were closed with loose interrupted sutures after a mixture of sulfanilamide and penicilin powder 4 parts to 1 had been dusted into the wound The external wound of entrance and exit were left open only if the skin defects were too large to close or if the interval since wounding had been olon that infection seemed likely Tight adhesive strapping was then applied over a vaseline gauze dressing

There were 4 deaths in this group Two of them were due to shock and henorrhage in mediately after operation. One man with bilateral hemothorax died of pulmonary cet an 23 hours and another 3 hours after operation. In the latter case circulator fail use was probably precipitated by the as ministration of too large amounts of phodo and plasma.

In the third group of 16 cases thoracolomy and transdiaphragmatic repair of upper abdominal structures were performed. Rib rescribed was carried out in 10 patients 2 of whom bad segments of 11 patients 2 of the 10 patients of 10 pa

The frequency of involvement of the vari ous abdominal organs is interesting. The liver alone was involved in 8 cases liver and kidney in 2 stomach and liver in spleen and stom ach in I spleen and kidney in I and the dia phragm alone with diaphragmatic hernia in a The other case illustrates how extensive these wounds can sometimes be This patient had a sucking wound of the left lower chest through which gastric content was escaping. A thoracotomy was done first after resection of the 7th rib and transdiaphragmatic repair of a lacerated liver and a perforations of the stom ach were carried out After closure of the chest laparotomy was performed 12 mehes of jejunum resected and end to end anas tomosis performed. In addition another iciu nal perforation was closed and the transverse colon was extenorized for multiple perfora tions He had bile in the pleural fluid for several days but otherwise his immediate postoperative course was fairly smooth

Five patients had a laparotomy as well as thoracotomy but it is of interest that ii ca es could be handled adequately from the thoracic approach alone Actually splenectomy and repair of the upper portion of the stomach are more easily performed through the chest than

through the abdomen

Six of these 16 patients with sucking the areacabdomnal wounds in whom transdra phragmatic operation was done died after operation 4 of them within 5 hours after surgery as a result of traumatic and operative shock. Another died 40 hours after transthorace splenectomy and repair of a perforated stomach apparently of irreversible shock. The other death was due to anuria 8 days after nephrectomy suture of a severe liver laceration and closure of the open chest wound

The subject of thoracoabdominal wounds is too large to consider in detail in this communication. To sum up however. In the opatients with sucking thoracoabdominal wounds operated upon 11 were subjected to thoracotomy and transdiaphragmatic procedures only 5 had a thoracotomy plus lapa rotomy and 4 had a laparotomy with simple closure of the chest wound and aspiration or intubation.

## POSTOPERATIVE MANAGEMENT

Oxygen therapy was continued on the ward in most of these cases with supportive treat ment with blood and plasma as indicated Gastric suction was started on recovery from anesthesia in cases of diaphragmatic hernia perforation of the stomach or intestine or in any other case with gastrie distention or vom iting Penicillin was continued in doses of 20 000 units intramuscularly every 4 hours usually for 5 to 7 days along with sulfadiazine 6 grams per day The latter was usually omitted in nephrectomy cases and in abdomi nal injuries or other cases requiring gastric suction Frequent turning deep breathing and cough were encouraged and morphine injections limited to 1/6 grain doses

The chest catheter was ordinarily removed in 48 hours after injection of 40 000 units of penicilin in 20 to 30 cubic centimeters of nor mal saline. Its patency was checked every 6 or 8 hours by aspirating the airway needle of the water seal bottle or it necessary by irrigating the eatheter with a little saline solution. If there had been gross contamination of the pleural cavity with gastric content or evidence of bile in the pleural fluid catheter drainage was maintained for about 4 days. If an empyema appears closed drainage must be continued.

Reaccumulation of serosanguineous fluid was usual but unless physical signs or chest films indicated a moderate effusion (i.e. greater than 200 to 50 cubic centimeters) it was not aspirated. If sub equent aspirations were necessary penicillin in saline was introduced as before and the fluid was not replaced with air. In our series 18 patients were aspirated once postoperatively usually on the 4th or 4th postoperatively of 50 cm separated twice and 2 were aspirated 4 times in an attempt to re-expand the lung.

Anteroposterior and lateral chest films in the sutting position were commonly taken on the 4th or 5th day after operation except in the case of thoracoabdominal wounds where the physical signs were the guides since it was thought best not to move these patients during the first week

In sucking thoracic wounds as in other wounds involving hemothorax and lung col lapse early re-expansion of the lung is a prime con ideration and this was encouraged by breathing exercise and by havin, the patient sit up over the side of the hed several times a day on the 4th postoperative day and there after. The latter procedure had to be omitted in the case of patients with thoracoabdominal wounds although they could be propped up on a back rest and deep breathing encouraged

# POSTOPERATIVE COMPLICATIONS

Postoperative shock was the principal complication and cause of death. It was evident in severe degree in 9 cases. Many of these patients had been in shock on admission and had improved enough to be operated upon but the additional factors of operative trauma and anesthesia proved to be too much for them. A few were operated upon while in shock who did not respond to treatment

Atelectasi was first evident postoperatively in 5 cases bronchopneumonia in 3 cases sore pulmonary edema in patients (both of whom died) and massive fatal pulmonary hemorrhage in 1 case. There were a instances of hronchopleural fistula in 1 case the fistula closed after 4 days of water seal drainage and the lung had re-expanded a few days later in the other a large pneumothorax remained in spite of repeated aspirations of air and the lung was still collapsed when the patient was

evacuated a week later
Two cases of wound disruption due to in
adequate closure and failure to intubate the
pleural cavity have already been mentioned
Some wound infection appeared in 3 cases
but undoubtedly it occurred in other cases
that they had left our hands since in most
instances the debrided wound bad been su
tured at operation. The diagnosis of frail,
implyema was not made in any of these patients before evacuation but it was thought
that at least several patients later developed it.

Drainage of bile from the operative wound complicated liver injuries in 3 cases and in 2 of these bile was present in the pleural cavity. In 1 case mild peritoritis was thought to be due to the presence of bile in the peritorial cavity and in another to contamination of the peritoneal cavity by gastric content from a perforated stomach.

Abdominal distention was troublesome in 5 cases. The use of gastric suction in many 0 the thoracoabdominal cases pr bally kept this complication at a minimum.

There were three transfusion reactions of the hemolytic type in this series. This his incidence can probably be attributed to the use of stored Type O blood without previous cross matching and to the rather lar e now ber of multiple transfusions given Urema occurred in patients with ladney many one of them had had a nephrectomy and many pair of a severe laceration of the liver and diaphiagm.

In addition there was a temporary tow psychosis in patients probably precipitated by pain and anova. A cutaneous reaction to sulfadiazine was seen in I case and thrombophiebuts of an arm vein after prolon ed us travenous therapy in I case

#### EVACUATION

The average period of hospitalization before evacuation in our series was 6 days but vand from 3 to 15 days depending on the individual case and the military situation Patients with laparotomy were kept for a minimum of 10 days. Occasionally military extenses quired us to evacuate our patients scotten we ordinarily would have done and once we were oble of to transfer patients to the care of another hospital unit be one they were ready for ex-cuation.

In general we kept patients with senous chest wounds for at least 6 days or more act those with thoracoabdomial wound for at least 10 days. It was thou ht that patient well enough to be evacuated at all could best be evacuated by air since the dan ers of anous and expansion of a pneumothorax were not anticipated in air tran port at low all tudes. Many of our patients were so evacuated

## RESULTS

Only the immediate results of treatment can be given since the final mortality and morbidity of these patients can be properly judged only after aeveral months of oberral tion. For the surgeon in the field however the question of immediate results is an important one. There are several factors which affect operative mortality in these cases among them the length of time between wounding and admission which very often depended upon the military situation and the admission of a large number of other priority ca es The desire of the surgeon to do all he can for a badly wounded man in spite of poor response to shock therapy will increase the operative mortality. At the same time how ever such a tendency may favorably influence the overall total mortality. It is with the total mortality that we should be concerned since operative mortality varies with the estimation of operability Experience has encouraged us to increase the operability rate. In this series or per cent of our patients were subjected to surgery

Seventeen of this series of 70 pattents with sucking wounds died and represent a mortality rate of 24 per cent. Six of them died without operation in from 4 to 24 hours after admission as the re ut of shock which did not respond to treatment. In 2 cases pulmonary deema was prominent and in rease morphine poisoning appeared to be most important. The r1 postoperative deaths in the 64 patients operated upon represent an operative mortality rate of 77 per cent.

Both the general mortality rate of 13 o per cent and operative mortality rate of 7 6 per cent were less among 24, patients with pene trating and perforating nonsucking wounds of

the pleural cavity admitted during the same period Likewise patients with thoraco abdominal wounds without open pneumo thorax had a mortality rate half that of the sucking type

#### SUMMARY AND CONCLUSIONS

x Patients with sucking wounds of the chest make up an important part of the seriously injured casualties admitted to an exacuation hospital in a combat zone. The authors experiences with 70 such cases including 21 with thoracoabdominal wounds have been presented.

2 Adequate preoperative preparation in cluding the closure of the open pneumothorax with occlusive dressings the treatment of shock and anovia and the recognition of asso ciated abdominal injuries is highly important

3 Sixty four patients were operated upon an operability rate of 91 per cent. The indications for the various surgical procedures used have been reviewed.

4 Postoperative treatment is directed to ward the correction of circulatory and respir atory disturbances re-expansion of the lung and prevention of infection

5 The overall mortality rate 24 per cent and the operative mortality rate 17 per cent were higher than those for other patients with penetrating and perforating wounds of the pleural cavity

# ELECTRODIAGNOSIS BY MEANS OF PROGRESSIVE CURRENTS OF LONG DURATION

Studies on Peripheral Nerve Injuries in Man

LEWIS J POLLOCK MD JAMES G GOLSETH MD ALEY J ARIEFF MD d
FRANK MAYFIELD MD FACS Majo MC AUS Chc 111

HE relation existing between the rate of variation in current and the min mal strength of current required to produce exeitation has been investigated by physiologists for many years since an attempt was made to study it by DuBois Reymond in 1862 Bernstein von Fleischl von Kries Fick Schott and Gildemeister were among the older investigators.

Such so called progressive currents as have been studied may be divided into linearly in creasing or progressive currents and exponentially increasing or progressive currents

Among the more recent investigators to whom more accurate methods of measure ment have been available and who have stud ied exponentially rising currents may be men tioned Liberson Schriever Delville Cardot and Laugier d Hollander Solandt and Fahre In these experiments the duration of rise of the exponentially increasing current to its peak was less than one second often fifty to two hundred milliseconds. In the more recent experiments on linearly increasing or progres sive currents the longest period likewise was usually less than a second in the case of Lucas seconds In 1907 Lucas published the re sults of his studies on the scratic nerves of the toad and frog and on the sartorius muscle of the frog He found that the minimal rate of rise which he called the minimal current grad ent in the case of the toad was of such an order that the luminal strength at instantan eous stimulation would have to be increased 46 times at the end of a second to produce an effective stimulus for the scratic nerve of a froe the minimal strength at instantaneous

froe the minimal strength at instantaneous From the partin t fix is usual M al Diseases. A rit was m tun insty Medical School d P of J es General II p tal B till C ek M chigan. The w k described in the per was d und co trac economicated the Commit Victoral Research, between the Office 18cm in Research and Des 1 pm and A rithers in the may be

stimulation would have to be increased 6, times at the end of a second to be an effective stimulus. Amon, his conclusions is the following statement.

It is found that as current gradient is de creased the current strength required for a citation increases more and more rapidly unid a definite minimal gradient is reached ho gradient less steep than this will excite

The behef that progressive currents posses us, less than a minimal rate of rise will destinulate even though they finally reach a considerable value was likewise expressed by Hill From Lucas experiments Blair reached the conclusion that when the gradient is to low for the rheohase to be effective no voluse seffective.

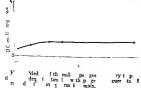
In an analy is of Solandt's data obtained from stimulation of the frog's scattic nerve with exponentially rising currents it may be seen that with a minimal gradient the current increases at a rate such that a value of times the rheobase value is reached in 027 second

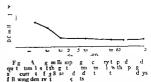
In a former publication some of us (13) showed that when progressive currents of let duration 12 2 6 38 and 8 8 second ar used as stimul for normal cat muscle at were unable to confirm the existence of the immal gradient. In the case of the normal muscle the liminal current at instantaneous stimulation or the rheobase was 0 milhampere at 12 seconds the current was 0 milhampere or twice the rhockse at 3 seconds 10 milhamperes or 26t times the rheobase at 1,0 second 11 milhampers or 15 times the rheobase (EFr 2) At no time was the rheobase current adequate to stim was the rheobase current adequate to stim ulate yet with a current of lone duration (5).

seconds an increase of only 87

In earlier years the impetus for develop ment of new wave forms of stimulation was the desire to imitate the normal contraction of a muscle and to avoid the abrupt move ment produced by sudden closure of a current whether faradic or galvanic (Bergonie) In 1007 Bordet described an apparatus for the production of a galvanic wave current lasting as long as 2 5 seconds With regard to diag nosis he noticed that when a muscle is de generated the time necessary to reach a current adequate for stimulation is long as compared with that necessary for normal muscle with which the liminal current must be reached more quickly For similar reasons Laquerriere designed a new apparatus on the basis of the work of Bergonie In 1912 Becker described an apparatus called a myomotor which de livered saw tooth waves. In 1931 Delherm and Laquerriere described an apparatus which delivered alternating currents of long duration and unidirectional galvanic wave forms. The currents described by Bordet Laquerriere and Delherm Duhem designated as currents of long period to distinguish them from currents described by d Arsonval in 1891 and by La picque who without knowledge of the work of d Arsonval published his results in rors

Whereas the currents designated as those of long period may last several seconds those desimated as progressive currents by Delherm last only a fraction of a second From the standpoint of their contribution to diagnosis it is said of both types that a degenerated muscle will respond to the condition in which a liminal current is reached more slowly whereas with the normal muscle this amperage must be reached more quickly





Although many articles in the literature are concerned with progressive currents of long period (more than 2 seconds) the clinical material from which data have been obtained is small. No accurate measurements of time and current are described and no experimental work is recorded.

It is necessary we believe better to define a progressive current We take such a current to be one which increases with time. The kind of progressive current is determined by its wave form for example whether linear ex ponential or sinusoidal The progressive cur rent used in our former experiments was a linearly increasing one consisting of the as cending limb of a unidirectional galvanic wave of isosceles triangle type. The decision to use a current wave of this type in preference to a saw tooth wave was based on several con siderations. In the first place one is able to observe a contraction at the peak of the wave Also one is able to obtain simultaneous read ings of the voltage and strength of current at the instant of the contraction. In addition one is pared the confusion resulting from unwanted break contractions which are likely to occur with the saw tooth wave

As the result of former experiments we showed that in the cat within a few days after denervation the amount of current necessary to excite the muscle by progressive currents of long duration was usually somewhat higher than the amount required by the normal muscle. It began to diminish after about o day, and between 30 and 40 days it was less than normal and remained 80 as long as the unimal were studied.

It was seen that as long as 203 days after denervation the rheobasic current being 0 18



O hasobas

Fg J Milliamp g ecessary t p od dq t
tum! f th g t m m cl f cat 5 dys
aft pnm y t d4days ft p ns cha t
st f d r v tedm i h b f d

milliampere contraction occurred at 8 8 sec onds with 0 27 milliampere (Fig 2)

In contrast to the period of deneration at times before and sometimes coincident with evidence of motor return the amount of cur rent necessary to produce excitation must be increased considerably above the rheobase when the current 1 allowed progressively to increase for long period Thus in Figure 3 4 days prior to the recorded examination made 52 days after primary suture the muscle re acted as a denervated one On the 22d day the rheohase was 115 milliamperes at 12 seconds contraction occurred with 2 5 mills amperes at 26 seconds with 3.75 milliam peres at 3 8 seconds with 4 milliamperes and at 8.8 seconds with 5.72 milhamperes. As regeneration progresses the amount of current necessary for excitation becomes even greater and a normal pattern is not reached even when fairly good motor recovery has taken place (Fig 3)

Soon after we had be, un to examine mus cles supplied by injuried peripheral nerves in man it was found that the use of absolute values of the threshold amperage for progressive currents of lone duration to indicate denervation and regeneration mi, the lad to misinterpretation in some cases. The reason for this 1 found in the fact that when the rheobase is high the threshold amperage for progressive currents must be higher there fore when as the consequence of edema or other chances in the tissues the rheobase or threshold current for instantaneous stimulus.

is high the threshold amperage for progressive currents must be higher therefore when a the consequence of edema or other changes in the tissues the rheobase or threshold current for instantaneous stimulus is in high the thin hold current for progressive current i of bright duration must be still higher. As a result in some cases when a muscle i denervated the absolute value of the threshold ampera of the progressive currents of lone duration may be progressive currents of lone duration may be suffered to the control of the c

high in others low From data described in precedin pan graphs it may be seen that the ratio between the rheobase and the threshold ampera e of a progressive current lastin 8 8 seconds nas 2 87 in the normal muscle of a cat 15 for a denervated one and 77 for the recoverir muscle 52 days after suture. When there fore one find a muscle with a hi h rheolage it is necessary to determine the ratio between the rheobase and the threshold current for stimuli by progressive currents of lon dura tion This ratio may be called the ratio for progressive currents to distinguish it from the tetanus ratio for instantaneous current stimulus

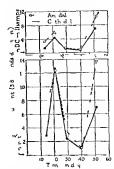
The ratio for both cathodal and anodal stimuli should be obtained since as will be seen the approach toward unity of the polar ratios for progressive currents is characteristic of the state of deneryation of a muscle

The volution of the changes in this ratio a well as the threshold current as related to the time following section and suture of the data nerve in the cat is constant and characten to these changes may be divided into four prods. The first during the very early period degeneration occupying about 14 days the second during, the remaining period of degeneration until the period of complete denervation had occurred from the 31st to the 40st had been the third the period of denervation and the fourth the period of regeneratin becaming, from the 440th to the 66th days.

During the first a days a number of changes occur the significance of which we do not at this time know. They consist of two phenomena first a very rapid fatigability to progresse currents and a failure to contract when the current is increasing but a contraction when after a current has reached its peak at

approaches zero Exclusive of this very early change the responses during the period of degeneration and regeneration have a remark able similarity During degeneration there is a rapid increase in threshold current both for anodal and cathodal stimuli by progressive currents of long duration reaching a peak at variable times usually from the 17th to the 23rd day at the same time there is an increase of the ratio of progressive current both for anodal and cathodal stimuli but usually in contrast to the period of degeneration the in crease in the ratio is much greater than the increase in threshold current. Then both the threshold current and ratio continue to di minish until the period of complete denerva tion occurs. At this time the threshold current at a minimum both for anodal and cathodal stimuli and the ratio often is at units or a little more both in the case of anodal and cathodal stimuli When regeneration occurs there is a relatively sudden increase in thres hold amperage for both anodal and cathodal stimuli and also a marked increase in the ratio both in the case of anodal and cathodal stimuli (Fig 4) During the very early stage of regeneration the same peculiar reactions as were seen during very early degeneration are at times noted particularly failure to con tract when the current is increasing and re sponse nhen after having reached its peak the current has returned to almost zero

The state of denervation is readily demon strable by the approach to unity of the ratio and minimal threshold current as well as the approach to unity of the polar ratio If one does not take into account the time which has elapsed since the date of injury so that an opinion may be derived as to whether the state of denervation should be present were the nerve severed or completely injured then from the data of a mole examination there might be some difficulty in differentiating the increase of threshold amperage and ratio found during degeneration from that found during regeneration. Usually although the ratio is hi h in both the threshold amperage is much lower during degeneration than re generation Thus it may be aid that when the threshold amperage is only moderately high and the ratio quite high we are dealing

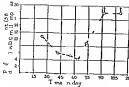


with the changes of degeneration. When both threshold amperage and ratio are high, we are dealing with regeneration.

Although we have found this to be true in our experimental work on the cat we have found an occasional exception in man when the threshold amperage as well as the ratio was high and even higher during degeneration than regeneration. However, it sufficient time has elapsed for complete denervation to have taken place then a high threshold amperage and high ratio indicates recovery If at one examination a liminal threshold amperage and a ratio approaching unity and an approach to unity of the polar ratio are found and at a subsequent examination a high threshold amperage and high ratio are found recovery is indicated.

#### CLINICAL APPLICATION

Although unequivocal evidence for the state of denervation and recovery in experimental lessons of the sciatic nerve in the cat has been adduced by data obtained from stimuli hy progressive currents of long duration the



Fg 5 Thresh id rr t th hum th h tumused t ru us d ys f ll win j ry d se lb pe i rv h p ress t f g d d t L d to-c d t f th se red p l d 6 d ys ft j y

validity of this method of diagnosis must be tested by its application to injuries of the peripheral nerves in man

We have examined over 50 cases with lesions of various peripheral nerves about half of these were civilians and the others wounded soldiers examined at the Percy Jones General Hospital at Battle Creek, Michian

The evolution of the changes in threshold amperage and ratio for progressive current stimuli in time after injury to a peripheral nerve injury in man is the exact counterpart

of that in the cat Exclusive of the very early changes observed in the cat in man after the 1.4th day following severe injury there is a rapid increase in threshold amperage for anodal and cathodal stimuli by progressive current of both 1 and 4 second duration This is succeeded by a progressive diminution in threshold amperage untd the period of denervation is reached when it is at its minimum and the polar ratio approaches unity Then when recovery oc curs there is again a rise in threshold amper age usually of a much higher order than was the case during the period of degeneration This may be illustrated by the chart plotting the measurements obtained in a case of peroneal nerve severed by a knife blade at varying days following injury and uture

In addition there is a parallel claime in the ratio derived by dividing the rheobase f anodal and of cathodal stimuli respecti elyinto their threshold current. At first there is a

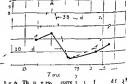
(F10 5)

rise in the ratio for stimuli of both 1 and 38 or 4 second duration then a diminution until at the period of denervation the rato approaches or 1s at unity and the polar rise also approaches until. Then when recover occurs the ratio increases usually to a dere as high often higher than durin the pended degeneration. This may be illustrated by a graph plotting the ratio for stimuli of 1 and 38 or 4 second duration in a case of Belling and 1s beginning 27 days after 115 onset (Fi. 6) palsy beginning 27 days after 115 onset (Fi. 6)

During the period of denervation a umis approached or eur is for the threshold an perage and the ratio for stimuli of 1 or 4 seconds duration. On the other hand dum degeneration and regeneration the threshold amperages and ratio for stimuli of 1 and 4 seconds duration respectively differ the for the stimulus lasting 4 seconds being in hir This may be seen in Figure 7.

When it is possible to examine a patient who has sustained an injury to a peripheral nerve at frequent intervals throw hout the whole period of time from that of injury to that of recovery the validity of a method could quickly be determined. Unfortunately we have been able to do this only in a few cases among the civilian population.

More frequently we had the opportunity to examine patients but once or twice at some period of time following injury or operation. This was particularly time of the cases of wounded soldiers. Certain other standard however can be established for the validity of this method in such cases. In the majority of cases we did not have the opportunity of examining, the patient until a time had elap-ed.



Fg to The p gess current if di sec d d to t try: g d ys f li g th set mpl t B h palsy

which either resulted in a state of denervation or a state of recovery from a severe lesion

When the characteristics of a state of de nervation in a muscle had been found the validity of such a dia\_nosis could be assessed by the following means First that at opera tion preceding the examination by a number of days insufficient for regeneration to occur the nerve end were found to be severed Second that subsequent operation revealed a severed nerve. Third when a state of denervation was found in a patient in whom operation was not performed spontaneous recovery later occurred at a time compatible with regenera tion and was made evident by the characteris tic changes in threshold amperage and ratio or later recovery of motion or sensation or both Fourth when in some of the muscles supplied by an injured nerve characteristics of recov ery are found by examination with progressive currents of long duration and in another or others characteristics of denervation these muscles later at a time compatible with re generation show characteristics of recovery of muscles as found by examination with progressive currents or recovery of motion or sen sation or both Fifth the characteristics of regeneration follow those of deneration at a tune when regeneration could have occurred

When the characteristics of a state of regneration or recovery had been found the validity of such a diagnosis could be assessed by the following means. First that at operation preceding the examination the nerve was found not to be severed or completely compressed. Second that at subsequent operation the nerve was found not to be severed or completely compressed. Third that motor or sensory recovery ensued. Fourth that motor or sensory recovery was present at the time of examination. Lifth when some of the muscles supplied by a nerve showed the characteristics of recovery later recovery of motion and sensation occurred.

# RESULTS OF PERIPHERAL NERVE INJURIES UN MAN

In 36 patients at one time or another in the course of recovery after a peripheral nerve lesion examination by progressive currents of long duration showed the characteristics of a



F 7 Thr hidp gressi cur tand ts f d 4 ds d si in th gastroc emius m scle t ryang d ys f ll r g p im ry s t f th sci ti

recovering nerve muscle complex. The confirmation of the validity of this electrical sign consisted in one case of an exploration a short time before examination which revealed no severance of the nerve in another explora tion soon after examination showed nordis continuity of the nerve In 4 there, was subsequent clinical evidence of recovery of motion or sensation or both. In 8 chinical sions of recovery of motor or sensory function were present at the time of electrical examina tion In 2 the validity of the characteristics of recovery consisted of their appearance after the electrical signs of denervation had been present and a period of time compatible with recovery ensued This progression from the electrical sions of denervation to those of regeneration were also found in 7 other nationts in whom the validity of the electrical signs of regeneration were confirmed by the fact that at an exploratory operation performed a few days before the examination the nerves were found severed in 6 cases. In 1 case a hypoglossal facial anastomosis had been performed before the examination. In 6 later recovery of motor or sensor; function followed the appearance of electrical signs of recovery ata time compatible with recovery. Three of these had all o been confirmed by the findings atoperation. In there occurred recovery of motion or sensation or electrical signs of regeneration at a later date which was compatible with recovery.

There were 4 cases in which the rheobase was so high in 1 40 milliamperes that examination hy progressive current was impossible hoth hecause of insufficient output of current and if available such a high rheobase is a sign of recovery was found from the fact that later clinical evidence of recovery of motion or sensation or both was found in all cases and milliance to the control of the contr

In 4 cases electrical signs of recovery were found but at clinical examination 80 130 97 and 90 days respectively after injury no motor or ensory recovery was demonstrated However it 1 quite probable that such recovery will take place. In rease electrical signs of recovery were shown to be present only 36 days after siture of a perioneal nerice afthough this is quite early nevertheless we felt that it is quite possible that the nerice is recovering.

In only 2 cases was the method brought into question. In both the deep hranch of the radial nerve was injured. In 1 the electrical examination was performed 140 days after operation which revealed that the nerve was severed. In the other the electrical examination was conducted 12 days after operation which revealed a severance of the deep hranch of the radial nerve. The operation was performed 9, days after injury. Only one muscle had been examined in each of these cases. Here we field it squite possible that some new fibers had found their way to the distal segment.

Of 5 patients examined when electrical signs of recovery occurred the later course confirmed their validity in all but 7 cases in 5 the time which elapsed from the date of suture or injury may well be too short for motor or sensory recovery. In 2 only was

there an equivocal result. In all of the i stances when the electrical signs of deneration were found there was a confirmation of the validity of this electrical arm

#### DISCUSSION

The indication for the development of metods of electrodia, noise other than by estimation by stimuli of galvanic and faradic curreas described by Erb is found in the fadurer such methods as ordinarily performed to give accurate evidence of the states of de-entrial denervation and regeneration. Some of the inaccuracy is the result of imperfect knowledof the difference in the responses during denervation and regeneration. Some is the resuof moorrect views which have been pared down in text books and literature and part duto limitations of such methods.

The state of complete denervation of a muscle can with assurance be determined by such methods both by the very small threshold amperage or rheobase and the approach to ward or to unity of anodal and cathodal ck in, stimuli or unity of polar ratio. The i other states de eneration and re eneration are then recognizable by the absence of the characteristics described. However it would be difficult to differentiate the degen ratur from the repenerating state Althou h the ex astence of respon e to faradic current 14 of more days after a lesion indicates a pon taneously recoverable lesion this method is of Little value in war wounds Such lesions re cover m a short period of time and by the time a wounded man would have reached a hospital suitable for nerve surgery recovery of motion or sensation or both would have occurred On the other hand in a spontare ously recovering but everely injured nerve other clinical signs of recovery usually ante date the response to faradic current

Atthough our former work on stimulation by progressive currents of long duration of dicated clearly that the relatively rapid increase of threshold amperage was an accurate underston of recovery further work upon human material showed that this was not in itself as fee indication. The reason for this was four on the fact that in some c see because if the same of the same of the same four of the man and the fact that in some c see because if the same of the s

threshold amperage may be present only be cause the rheobase or threshold amperage for unstantaneous stimuli of infinite duration was also high. It was therefore concluded that determination of the ratio for progressive cur rents of long duration was a necessary part of the examination. The is the ratio between the threshold amperage of a progressive cur rent of any given duration and the rheobase both for anodal and cathodal stimuli.

We have shown that the characteristics of , response to progressive currents during de generation consist of (1) some unexplained peculiar responses very early during degenera tion usually within the first 14 days consisting of contraction when the current has reached zero from a peak (2) a subsequent early rise in threshold amperage and in ratio both for anodal and cathodal stimuli (3) a fall in both as the state of denervation is approached dur ing all this time there is a disunity between anodal and cathodal stimuli During denerva tion the characteristics of changes occurring consist of a minimal threshold amperage an approach toward or to unity of anodal and cathodal stimuli and a unity of the ratio for progressive currents both in the case for anodal and cathodal stimuli When regeneration oc curs durin, a very short time the characteris tic changes are fleeting responses, only when the current has reached zero from a peak then a sudden increase in threshold amperage or progressive currents usually much higher han in the degenerating state a very high atio and a di unity between snodal and athodal stimuli

In interpreting the results of examination by propersive currents of long duration it is found that the characterities of the state of deneration are unique for that state. Both during some time of degeneration and during regeneration a high threshold amperage for propressive currents and ratio is pre-ent. However a high tatio and only a moderately high ratio was threshold amperage are found during the state of degeneration and a very high ratio and also threshold amperage current regeneration.

The time which has elapsed from the date of injury or surgery must also be taken into consideration. When a sufficient time after injury has elapsed to permit the development

of the state of denervation and the character istics of denervation not found the nerve ispontaneously recovering and should not be operated upon. If after a suture of severed ends of nerves characteristic of the denervated state are not found one may be certain recovery is taking place. When a sufficient time has elapsed after mjury to a nerve to have permitted regeneration and the characteristics of denervation are found the nerve must be operated upon

Although the characteristics of the regener atme state indicate that some nerve fibers have regenerated and reached the muscle be ing examined this does not predicate complete recovery of other muscles supplied by the nerve involved. More accurately to predict the completeness of recovery all of the prin ciple muscles supplied by such a nerve must be examined At times proximal muscles may show the characteristics of regeneration for example the flexor sublimis digitorum and flexor profundus digitorum and the flexor carpi radialis in a median nerve lesion and the ab ductor brevis pollicis and opponens pollicis show the characteristics of denervation. In such a case the later appearance of the charac teristics of regeneration in the latter muscles would lead to a good prognosis

For the most part a high rheobase at a time when if a nerve would have degenerated com pletely were it severely injured or severed indicates recovery When such a rheobase is so high that examination by progressive cur rent is impractical either because sufficient amperage would not be available or because of the painfulness of the very high order of current necessary further examination is needed This should consist of determining whether the anodal and cathodal closing stimuli are at or near unity and whether the ratio between the tetanus produced by instantane ous stimulus by strong currents of infinite duration or square waves and the rheobase also approaches or is at unity. When these characteristics are found despite the high order of the rheobase the muscle is in a state of denervation The necessity for this additional examination however rarely occurs and when it does ordinarily characteristics of regeneration will be found

These electrical signs of recovery have been found to precede clinical evidence of motor or sensory recovery for variable times. In some instances the interval was quite long in one it was 150 days

# CONCLUSIONS

The characteristics of responses to pro gressive currents of long duration during de eneration denervation and regeneration are described

The usefulnes of the computation of a ratio for currents of long duration is pointed

- 3 The characteristics of the state of de nervation as described are unique for that condition and consist of a minimal thre hold amperage for contraction and unity of ratio for stimuli by progressive currents of londuration
- A very high ratio or a very high threshold amperage are indicative of regeneration
- 5 A high ratio and only a moderately high threshold amperage are characteristic of the degenerating tate
- 6 The validity of this method of examina tion for the diagnosi and prognosis of pe ripheral nerve lesions in man was established by the examination of 5 patients suffering from peripheral nerve lesions. In only 2 cases was there any question of its a curacy and for the e a possible explanation is made

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# THE EFFECT OF COTTON AND CATGUT IN HERNIAL REPAIR ON POSTOPERATIVE TEMPERATURE AND PAIN

RICHARD W ZOLLINGER M D FACS C ptain M C AUS Columbus Oh and WILLIAM J FLYNN M D Capt M C AUS Cle eland Ohio

A Army Hespital offers an unu ual opportunity to study wound healing in a standard group of young men who are good health. Therefore an analysis was made of the inguital beam operations done with either the properties of the study and the study was done in order to determine whether any completely objective measurable e induce could be found to support the use of one type of sature material over the other.

The chincal impression that wounds which are closed with nonbisorbable sutures heal more readily than do those closed with catigut is in accord ance with the writings of kooker Haisted Whip pile Shamkaugh and Howes and Harwey also the climical impression that cotton excites neless reaction in a wound than does all, is in agree must with the work of Mead and Ochsner.

Direct completely objective unbiased measurement of the degree of postoperative reaction extends by certain suture materials in groups of human patients is not practical to obtain Indirect methods are of value if applied to a sufficiently large well standardized group of cases. These methods have been used in cases in which wounds have been closed with catigut and cotton sutures by measuring (1) the temperature react on and (2) the narcotics and sectaives required for relief of postoperature pain.

#### CASES ANALYZED

Groups of hermorrhsphus standardzued except for the suture mate al were analyzed (Table I). Approximately half of the cases were repaired with cotton and half with catgut. No recurrent hermass were included in the senes: The differences in axe a e age beight and weight of patients represented in the groups were not significant represented in the groups were not significant in the control of surgeons including residents a training. No one surgeon of enough of the operations in any group to affect the statistics appreciably by his skill of lack of skill. The are age operating

From the Surgical Service AAT Reg. al Hospital Truax Feld Madiso. Wasconsin,

time in the cotton and catgut groups was not significantly different (Table III). All operations were performed under spinal anesthesia with 8 exceptions. In it general anesthesia with 8 exceptions In it general anesthesia was used throughout. The postoperative reactions in these 8 cases are within the normal distribution for the grouns and do not affect the final average.

Following operation these patients were returned to the various surgical wards without distunction as to the type of suture material used Because these soldiers were young and in good general health at was possible to employ routine orders in all cases during the immediate post operative period. The nurses had no knowledge of the type of suture material used so the drugs were administered as required by the patient s own subjective reactions. Since the cases were analyzed over a considerable period of time many different nurses cared for these patients. There fore if any nurse had personal prejudice as to the giving of drugs postoperatively her feeling would not appreciably affect the results in the series The postoperative temperatures of patients were factual affected only by the patient's physical status All patients developing any type of post operative complication were excluded from the final analysis

In this study 163 unilateral and 50 hilateral the unal bermorrhaphies were reviewed (Table I) Et hty three of the unilateral hernias were re paired with cotton Five of these cases were ex cluded from the final analysis due to postoperative complications which were pulmonary i case upper respiratory infection 3 cases scarlet fever with secondary deep stitch abscess I case Eighty unilateral hernias were repaired with catgut Eleven of these cases were excluded due to post operative complications which were pulmonary 3 cases statch abscesses 3 cases wound infection 2 cases upper respiratory infection 1 case scarlet fever I case hematoma in the wound I case Twenty five bilateral hernias were repaired with cotton Seven cases were excluded due to post operative complications as follows pulmonary 4 cases bematoma in wound 2 cases stitch abscess I case Twenty five bilateral hermias

TABLE I -HERNIORRHAPHIES ANALYZED

	Co		Ca gu		
	Umla 1	LaI ral	Und ral	B1 ral	
N mbe feases	5	80	-		
Cases hmina d (pos pera m plica ns)				5	
N tal	3	a	69		
Cod ans 1 ed bouts	5				
Cod la ed (Bass )				3	
Cod as 1 c	3	4		7	

were repaired with catgut. Five were excluded due to postoperative complications which were pulmonary 2 cases upper respiratory infection 1 case incision into bladder at operation 1 case mild wound infection 1 case.

After all cases with postoperative complecations were excluded their remained for analysis 78 unilateral and 18 bilateral hernias repaired with cotton and 69 unilateral and o hilateral hernias repaired with caterit. Several different types of repair were done. The type of hernia repair was not found to have a statistically significant effect on the final results in this study.

There was no simificant difference in the average age wei ht and height of the patients having cotton and cared unlitheral hermornhaphies. Likewise the difference in operation time was not striking. The same was true for the bilateral hermornhaphy groups (Table II)

TABLE III —UVILATERAL HERNIORRHAPHIES STATISTICAL ANALYSIS OF POSTOPERATIVE TRYPERATURES

Pos pera da	A A	A rage mpera		Diff and d	R
	Cu	Ca gu	m ans	77	
D f	98	99			 Sŧ
	99	90			 s
	99	99		a1	 5
	98	90	-	86	 S
	98	98			S
	98	98			 5
	qs.	438			

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TABLE II -ANALYSIS OF COMMON FACTORS

H m	\$ ur	A ra	Avera	Avera b b	Averag opera ng	l cases	
Und al	Co	5.4	66	5 9	41	,	
Chit. TI	C gu	6		5	5	69	
Bla rai	Co to		6	-	85	_	
	Ca eu		_			-	

# POSTOPERATIVE TEMPERATURES

Postoperative temperature curves were determined for each of four groups in order to compare the umilateral cotton to the umilateral cated hermorrhaphies and the bilateral cotton to bulateral category and the bilateral cotton to bulateral category and the bilateral cotton to bulateral category category and the bilateral category and the bilate

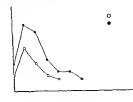
those of the hilateral groups The difference hetween the temperature curve of the unlateral cotton hermorrhaphes and the unlateral catton hermorrhaphes was striking (Fg 1) The avera e temperature on the farmorrange of the cotton ascompared to 100 odegrees F for cutton ascompared to 100 odegrees F for catton ascompared to 10

TABLE I, —BILATERAL HERNIORRHAPHIES
STATISTICAL ANALYSIS OF POSTOPERATIVE
TEMPERATURES

Piv   Are   re   Diff   Co   Ca   re   Co   Co   re   Co   Co   Co   re   Co
D
97 00 8 P51 97 00 S1 98 275 S2 S
98 10 6 88 5.
- 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1
98 99   1 1 1
04 90 8 5
98 98 88 5
95 6 03 8 85 1

F I ta f l /F he test General Sta ics C to ad Co de 33 Pre Hall fac

b) sho



Fg G phill thigh day p to the timp test to take guilt the high with cost catout time to !

the catgut ca es These figures are of statistical significance (Table III)

Temperature curves which were similar but of greater magnitude were found in the bilateral hemiorhaphy groups (Fi 2). The average temperature for the first postoperature day was 90.9 degrees. F for cotton as compared to 100.4 degrees. F for cotton as compared to 100.4 degrees. F for cotton 100.6 degrees. F for catgut second day 93.0 degrees. F for cotton 90.6 degrees. F for catgut Furthermo e a normal average temperature was attained in the control cases on the fifth postoperature day, as compared to the seventh postoperature day as the catgut cases. The statistical's guificance of these first es shown in Table 13.

### NARCOTICS AND SEDATIVES

The amount of narcotics and sedatives g ven postoperatively was now determined for the four

TABLE V — UNILATERAL HERNIOFRHAPHIES
STATISTICAL ANALYSIS OF NARLOTICS AND
SEDATIVES

Narco es d seda ves	A mbe dose pe pa		D ff nc means	D# tadd		R maks
	Co to	C pu	()		i	1
Cod		60	0	6		N S1
) hi		4				S‡
BP	1		00	18		S

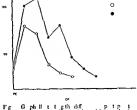
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F pl ( see C ad Col A 1

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trap t es fp t ts have gbl t lh h ph
th tt catgut t m tril
groups This was done in order to compare the

subjective discomfort of the unilateral cotton to the undateral catgut hermorrhaphies and the bilateral cotton to the bilateral catgut hermi orrhaphies The average number of doses of each drug per patient was determined (Fig. 3) Patients vith unilateral hermias repaired with catgut re quired nearly twice as much narcotic as those repaired with cotton. It seemed evident there fore that the postoperative course following catgut hermorrhaphies was more painful than that following cotton hermiorrhaphies. In the place of narcotics the patients in the cotton group used nearly twice as much sedation as did the patients in the catgut group. This fact was evi dence of restlessness rather than pain. The statistical significance of these figures is outlined in Table V

TABLE VI—BILATERAL HERNIORRHAPHIES SIATISTICAL ANALYSIS OF NARCOTICS AND SEDATIVES

Narce cs and f dote pe pa		Dff		(N)	, ,	Rm k		
	c <sub>o</sub>	Ca	0					
Cod za		4		4	8	- 8	NST	
э гры	3	. 8			8	88	PS:	
B b ra	4		60		8	88	51	
b C & C de 3 h Y F P H II la								

IPS P babl

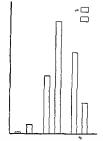


Fg3 G ph mp rungdoses f tacs deed to gn post pe to ly t p to its with unal t i h run rrhaphies t ed with it n catenit.

In the bilateral hermorrhaphy groups the find ings closely paralleled those in the unilateral groups As expected there was a greater but pro portionate increase in the dru's needed (Fig. 4) The statistical significance of these figures is out lined in Table VI

#### EVALUATION OF STUDY

This study of the immediate postoperative convalescence of uncomplicated herotorrhaphie showed that the patients with cotton repaired wounds had less general reaction than patients with catgut repaired wounds. This fact was evidenced by a lower daily temperature and a quicker return to normal by the cotton group Postoperative temperature is not due to suture material alone. In this study however other factors which might influence postoperative tem perature were controlled in the compared groups The only important difference between the group was the suture material used. There i no way to determine how much of the postoperative tem perature in the cotton rep ired groups was due t suture material and low much was due to other factors. It is reasonable to deduce however that the statistically significant difference of post operative temperature in the catgut groups com pared to the cotton group was due to the differ ence in suture materials. As has been shown this difference is definite and significant. These data substantiate the laboratory and clinical findings that wounds sutured with cotton show less post



F 4 G ph mp d es in ties and sed to so pot perati by t p to t with biltral her mhapbies tured with ti catgut.

operative induration and faster resolution of the induration than wounds sutured with catgut.

The study also indicated that patients will cotton repair do wounds had a more comfort by postoperative con alescence as evidenced by the postoperative con alescence as evidenced by the fact that patients with catigut repaired wound required more narcoties. In contrast the patie with cotton repaired wounds were able to 8 with a sedant ensisted of a narcotic. These fact is a set an elephon with the impression that the more marked induration in the catigut repaired wounds was associated with more tendences the wound area and increased subjective discomport on the part of the individual patie t.

By the time this se ies of cases had been completed the surgeons of this general sure claserium were in unanimous agreement that wounds it pured with cotton showed less postoperate duration and seemed less painful than woundrepaired with catigut. For these reasons the city epair of herma has been discarded on this surveil service.

#### SUMMARY

In this study 63 unlateral and 50 bilateral means hermorrhaphes in otherwise head, you , males we e reviewed to determine the stanta e of e their cartu of cotton suture material cases with postoperati e complications were excluded from the final analysis. There remarks were the study of the stanta and 18 histeral hermorrhaphes repaired with otton and 69 unlateral and 29 bilater I hermorrhaphes spatiel with careful and 19 bilateral and 19 bilateral hermorrhaphes spatiel with careful and 19 bilateral and 19 bilateral hermorrhaphes spatiel and careful and

7 Water

A comparison of the postoperative temperatures revealed that patients with unilateral or bilateral hermorrhaph es sutured with cotton averaged a lower daily postoperative temperature which re turned more quickly to normal than patients undergoing similar procedures in which catgut sutures were used

A comparison of the postoperative narcotics and sedatives administered revealed that the patients with unilateral and bilateral inguinal hermorrhaphies sutured with cotton required less narcotics than patients undergoing a similar proced re in which catgut sutures were used. The patients with wounds sutured with cotton required more sedatues

The presented data support the clinical impres sion that patients with wounds sutured with cotton material showed less postoperative wound reac tion and were more comfortable than patients whose wounds were sutured with catgut

# REFERENCES

# PARA ARTICULAR CALCIFICATION (PELLEGRINI STIEDA) IN AFFECTIONS OF THE KNEE

I WILLIAM NACHLAS M.D. L. t. t.C.1. L.M.C. A.U.S. B.ltm. M. yl. d. d. JOHN L. OLPP M.D. M. J. M.C. A.U.S. E. l.w. d. New J. v.

HE custence of anomalous calcufucations medial to the lower end of the femur has been known for a number of vears (3 4). Thou h this condition was originally conside ed to be a rarity recent reports indicate that it is not uncommon. Then ture of the mass its o ign its exact locat on and the proper man ner of treatment have all been subject to ary no consideration.

opinions
Opportunity has been presented to us to study carefully a rather large number of patients with such calcific deposits. With a 6 months o men ha e been sent to us for evam nat on and tre t ment for this condition. It has been possible to make careful clin cal and roenigenolo c studies of these patients. In addit on we were able to obtain a spec men at operation and laboratory stude so of this specimenha be been made. Finally dissect on of the pertinent a ea in g cada e s in 1 fresh hene atautopsy ga e ust the opportunity to e tab lish some interesting facts relative to the patho lo c anatom.

# PATHOLOGIC ANATOMY AND PATHOGENE IS

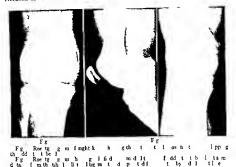
There has been conside able cont o ers a to which tissues are no loved in the formation of the calcified mass. The tibial collateral ligament the tendon of the adductor marnus muscle bursate the pe iosteum and the bone itself have all been considered () A careful study if the roentgenog ams has been helpful in locating the calcificat in

Roentgenogr pluc e minat on re caled these calcified masses to be stunted in the soft t ssues on the med l aspect of the knee directly over lying the diducto tube (F = r) I in a l w instances they seemed t be continuous w th the bone proper. In the cases if we changed the postion of the knee sil thit and took new ro in the programs we could demonst te the t and t incent t is t incent t is t incent t is t incent t is t incent t incent t incent t incent t is t incent t

i thin usu lly le than millimeter in width The calcification is difficult to see on a late at each of the knee joint indicating that it is not cry dense or thick. The le cl at which t is n ted that I the add cto tube cle som what po mal F on the Things Ger all Hoppial Teachons Alabama

to the bony attachment of the tibial collateral I ament and d stal to the area in which the ten don of the adductor magnus is fixed The sh do may appear as a short straight line. Whe it i more than a centimeter in length it appears t have the shape of a curved line and is more or less p r llel to the curve of the tubercle Fu ther length of the line is usually acquired pro imaliand s formed by a reversal of the curve so that on roentgenogr phic examination of the right k e it has the shape of a flat letter S The ne ly formed curved portion is somewhat further from the cortex of the bone than the ri inal straight part These f cts indicate to us that the tissue in which the lime salts are deposited is not part of the bone but overlaps the tubercle fairly intimately so the tat is con When the le gth is g eater ts p oximal po t n curves gently ; the opposite d ection to be parallel to the concavity of the bo e contour above the co dyle

A moe direct e minat on of the 1 volved structu es was pe mitted by the findings at ope a tion The skin neision which ran longitudinally ove the adductor tube cle was carried through the subcutaneous fat to the fascial ta This as then inc ed to exp se a v hite fib ous membrane that seemed to nvest the medi I aspect of the condyl r e pa sion of the knee. It co ered the tib al collate al 1 ament the add ctor t berde and the attachment of the tendon of the dductor magnu When neised at the le el of the add et r tubercle the u dersurf ce of this layer w s found to be adhe ent to an osseo s butto lke plaque that wa apposed to the tubercle a d was molde! o er t yet w s not p rt of t (F g 3) When the bony plaq e as emo ed the t be cle wa found to be somewh t less p lished in ppearance than tusu lly s b t tw sco e ed by a th n periosteal lay r No conne tion c uld be found between the d sected area and the ms de of the jo t Indeed when in the cou se of the ope at on the jit as entered it was ob erved th't about 2 centimeters sepa ted the uppermo t medial pa t of the inner jo t sp ce fr m the rea posed by the e ci 10 It ppea d theref re that the capsula layer th t surr nd the vn sal membrane was adherent to the inner aspect of the femoral



condule below the level of the adductor tubercle and that over this the e ran a layer of tissue which covered the tibial collateral ligament the adductor tubercle and the adductor magnus tendon (Fig. 4)

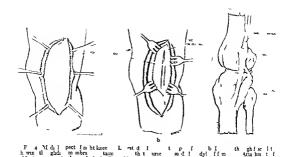
An attempt was made to identify this outer layer in standa d textbooks and atlases on anat omy but most of these references are rather brief in their descriptions Because of this dissections were made on routine cadavers in the anatomic laborators 1 It was fou d that beneath the fascia lata theree sted an aponeurotic layer that hugged the medial aspect of the knee rather closely cover ing the tibial collateral ligament, the adductor tube cle and the tendon of the adductor magnus This membrane was not firmly attached to the underlyi g tissue and indeed seemed to glide o er it. When the knee was fully extended and fo cible abduction was attempted the apo eu osis as seen to gl de distally er the tubercle The amo nt of mo ement was not g eat but a pin stuck through the layer and anchored in the peri osteum was clearly tilted d stally by this maneu er

D section of a knee at autops immedit tel, post mortem re cale Is milar structures but in dicated moe accurately the state of the I sease. When the I see I ata was nessed and retreted the membr ne that covered the medial skeletal structures of the knee was found to be gl steming and will te Three small usen ran parallel to each be compared to the covered to the co

other within the membrane coursing longitudinally from the upper part of the incision over the adductor tubercle to disappear in the deeper structures at about the level of the knee joint. The membrane gl ded casily over the underlying its sues and could easily be dissected off to expose the tubal collateral ligament the tendon of the adductor magnus and the clear polished adductor tubercle covered only by its periosteum.



Fg 3 M oc sect fplaq sec F h s g tru t f bo



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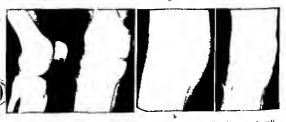
The location of the Pelles ini St eda calc fica tion is thus clarified. It is formed directly under a membrane that overlies the lower femoral condule on its med al aspect Lateral to it is the peri osteum of the adductor tubercle. When the cal c fic mass elongate t e tends in a proximal d rection so that it lies between the tendon of the adducto m gnus and the ove lying membrane The condition is not due to a f ment of bo e f om the femu a tear of th periosteum or a calcified burn

tl ghdi m mbra

St tistical reports based on our cases are likely t be misleadin since ou go pof p tients dies n t constitute a far mple Our p tient areall s ldiers ard are g ne lly you male adults M st of them had been exam ned pr nouls: nst llation whe e cute trauma i pre alent Only a small pe centa e of the knee c ses in thee units are t to us Ne theles it is pos ble to make some hypothe s as to the form tion of the lesson b onsider n the hi to es a d the clinical find g

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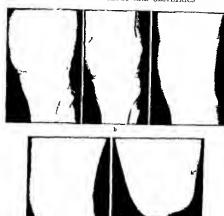
The calcification has generally been attributed to an injury consisting of a twist of the knee joint In our patients an attempt was made to deter mine if the condition was developed with or with out an injury If an injury had been sustained the patient was asked if he had had a direct blow or an indirect trauma such as a twist of the linee joint. The histories were not entirely clear in all cases Six patients gave histories of sprains or ts ists of the knee but only a few of them recalled in what d rection the leg was forced. Two patients reported direct blows on the joint but of these only 1 indicated that he was struck on the medial aspect of the knee Three patients had had twist ings with apparent reco ery but later sustained direct blows in automobile accidents or when falls g on their knees on the obstacle course Two nationts denied having had any injury whatso ever Their knee complaints constituted only a part of a polyarticular arthritis Two did not recall any injury and in the remainder the records are not clear. It appears therefore though major trauma is found in most of these cases that it was not the indispensable agent in the production of the condition. It is significant that in all of these nationts there was evidence of arthritis in the adjacent knee joint Ex minations revealed thick ening of the capsule occasionally there was fluid inc ease and on rare occasions there was limita tion of motion. All roentgenograms showed the bony 1 ppings that are considered manifestations of arthritis Since these changes are not produced immediately after an injury it must be deduced that joint inflammation had been present for some time prior to the prec pitating injury. Indeed one was able to obtain from the patients the his tory that the knee joints had been troublesome for months or even years before the examination that revealed the calcific masses The pains in the knees were chronic some being attributed to a weak joint while others were conside ed theu matic Since chronic inflammatory involvement of the knee was always coexistent it deserves con sideration as an etiologic factor. Thou h the cal cified m ss is outside of the joint the byperemia associated with the inflammation of the joint proper does affect the env rons and so supplies an important haison between the two areas of pathology

The element of trauma may be supplied by a sagle ser tet far but may also be the result of cumulative vear and tear produced by I chon of the membrane as it glides when the jo nt moves S nee the adductor tubercle projects medially it must form a local I ctor it tating the I can that more so cur it. Any adduction of the knee joint



Fg 6 O 6 dm ss lyng dd t t be l E th hiphitig ph ed ed g nizat fim th bealpe ph ry dt becul ted t be gru d

must produce a strain on the membrane particu larly v here it stretches over the promontory of the tubercle The area under consideration is thus vulnerable to degenerative irritations as well as to tearing strains On the other hand the frequency of runtures of the supportive structures of the knee on the medial aspect will out the subsequent development of the Pellegrini Stieda complica tion leads one to question any hypothesis that the rupture alone can produce this complication Furthermore in none of our cases was the injuring force of such magnitude that a major laceration of the medial soft tissues took place. In none of them did the sprain lead to an instability of the knee that would suggest a major lack of support on this side. Even the more severe twists were strai s rather than severe sprains. All of these factors make us believe that the ser es of events leading to the formation of a calcific deposit is as follows A process of attrition takes place on the inner aspect of the gliding membrane over the c treal point namely the adductor tubercle where friction can most easly be obtained. This process may have its origin in a series of small traumas that do not attract much attention. The process of attrition will be speeded by the swelling of the tissues that is induced by either polyarticular (systemic) arthritis or local traumatic arthritis of lo g standing (Fig 5) As a result of the degener ati e process affecting the undersurface of the membrane the tensile strength is reduced so that a relatively moderate injury may cause an incom plete tear This rupture is associated with a lacer at on of small blood vessels such as we have seen





in our dis seti in and permits a moderate amount of bleeding to take place. The terr in our of such mentude that a large hemorrhage is formed or that the permitted of the small hemorrhage is formed in the permitted of the small hemorrhage is trapped locally and modded in its position by the oute coating of the menta hat. The encapsulated hematoms thus firmed under goes degenerative chain es which und the poper physical and chemical could the slag of the calculation. The exact path of the formed under the property is all and them call could the slag only the same them.

demo str ted n ou cases It has howe er benshown elsewhere that blood co ta s within itself the elements that are necessary 1 p oduce cal in cation in areas whe the calcium and pho phosis con entrat n dequat and where a rich all almits e sts. The blood ellis a dplasma he is within them and est is of phosphorus as what the phosphorus are not not retem to mo gaine phosphorus the Whate et the them fo local calcrification in be thef circumsistic elefaction of hemations as a well known occur.

rence An early step is the leposition of limes alls is the form of calcium phosphate granules. The granular nature of the shadow is show in un our roentgenograms. Under some conductions of repair this unformed granular mass can he absorbed in other instances however there is a gradual organization of this m as that leads to the formation of hone (Fig. 6). The phase too is demonstrated in our serial roentgenograms (F. 7). The specimen's ever a tolk to examine represents this stare (Figs. 1 and 3).

We find many analo ous circumstances in the shoulder where similar lesions occur. These have been intensively studied. The supraspinatus ten unn ng as it does over the head of the hu me us a subjected to a considerable amount of frict on as the result of the movement of the arm In spite of the intervening bursa there is a great deal of attrition going on in patients v ho use their shoulders excessively. The degenerat e changes affect not only the bursa but also the adjacent surface of the tendon. Incomplete tears of the tendon have been demonstrated in many in sta ces. The precip tation of time salts in these areas is by no mea's uncommon. At fi st there is a soft creamy mass which becomes gritty at a late stage and not infrequently becomes organized into definite body of bone. Microscopic e amina t on of the tissues before organization has taken place reveals that there is a low g ade inflam matory process in the soft tissues in which the prec pitation takes place. We believe that the process of calcificat on at the knee joint s quite s milar to that of the shoulder

#### SYMPTOMS AND PHYSICAL FINDINGS

It is rather inte esting that when our patients were asked to local ze the pain in the knee they pot ted to the area just belo the patella None f them indicated the region of the adducto tubercle Since ve did not see them immediately fter the mjury that led to the calc f cat on they were asked if they had had pain near the tubercle None of them recalled any acute discomfo t in this Many of them had some discomfo t in the k ee at the extremes of extension and flexion Some of them had an ache that was p esent par ticularly on weathe changes and when they i rst a ose from a sitti g position. Othe s complai ed th t prolonged i alking made the L ee hurt. On examinati n one could feel the thicke ed c psule and an occasional ase I ad fluid increase Pressure ver the articula edge of the tib a produced pain in e ery ca e Palp tion of the adductor tubercle re ealed some local f liness which felt bony in har cter When compa ed to the rresponding

area on the unaffected knee there v as a distinct though not large horn prominence. In none of our ca cs could we move the calcified mass over the underlying hone. Pressure on this area gave discomfort in about half of the cases but at no time was tenderness great. We believe it possible to recognize chinically the existence of such a calcified mass in a large percentage of the patients if addition to the usual examination procedures for inju cd Ances we add careful palyation in the reason of the adductor tubercle. Of course after the local lessons have become radio-opaque roent genoraphic examination will leve ealther existence

#### TREATMENT

Since the calcified mass is extra articular and is so situated that it does not irritate tissues within the joint proper the knee joint and the Pellegrini St eda calcif cation must be treated independent of each other The articulation constitutes a prob lem that is not germane to this paper and must be treated on its own merits. The calcified mass in our group of cases bas not been a significant source of discomfort to the patients. It is conceivable that in the acute stage there may be an appreciable local irritation associated with the newly calcified bone and lavage of the precipitated lime salts may prove as valuable as it does in the shoulder calcification. We have had no experence with this procedure. Physical therapy in the form of local heat may have some value in clearing up the calcification ha ng been given to 2 of our pa tients in whom the lime salts disappeared Roent gen therapy likewise suggests itself as a therapeutic measure though we have not applied it in these cases Surgical intervention is in our opinion rarely necessary Inasmuch as the symptoms connected with these are relatively insignificant it is concervable that il the mass is large enough to cause increased irritation on the inve ting membrane furthe attrition of this layer at the critical point may take place. In such circum stances remo al of the plaque may be indicated tf surgery is contemplated one must recall the in junction made by Kulowski not to add the trauma f surgery to the area before the calcification and

o samazion have been complete Otherwise one may find a return of calcification in the scar of the operation. In our patients the only one that was subjected to operation had the bon's mass removed because an arthrotom was necessary for the removal of a joint mouse and the Pellegrim Steeda calcification could be removed at the same time without much trauma. Eleven of our patients were returned to full active military duty. Those who were not vere separated from the service for

reasons other than the calcification. Since only a of our cases had the calcified mass temoved and since all had been given an opportunity to exercise the restremities before the were discharged for the hospital we feel that the Pellegrim Steda cal ificat on does not enta l any appreciable disability.

COMMENT

The imposing name of Pellegin Steda ds case is im leading. It implies that the one finding of the calcification of er the addictor tubercle is a disease complex. The stress that is given the part cula manifestation tends to detract from v hat is usually the significant part of the patient's disease namely, the arthrit of the here joint Furtherme e because of the visualization of this anomaly, there has been a tendency to associate the symptoms of the affected Line with it. This belief has led to surgical intervent on for the re moval of the mass. In our opinion such an approach to the problem is inaccurate in that it stresses a relatively innocuous manifestation and tends to o e look the major of subling factor.

#### SUMMARY

- T enty patients with calcif cation over the adductor tubercle are reported and the operative findings in a case re described
- A description is given of anatomic dissections and I autopsy exploration of the area under consideration. These studies revealed the enit ence of a membrane which we consider a im
- po tant factor in the formation and shaping of the cleified mass

  3 The coevi tence of chronic arthrits of the kneers stressed
- An A hypothesis as to the etiology of the calcification is presented
- 5 Attention is directed to its relative clinical insignificance
  - 6 Conservatism in t eatment is stressed

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### THENAR PALSY DUE TO COMPRESSION OF THE MEDIAN NERVE IN THE CARPAL TUNNLL

#### R B ZACHARI FRCS O fod E gl d

> 1000 Hunt described a curious syndrome characterized by gradual atrophy of the ra dial part f one or both thenar eminences the result of paralysis of abductor brevis and ppone s pollicis The short flexor of the thumb is usually spared the e is no fasciculation the reaction of degeneration is present in the affected muscles and the cond tion never involves the interesse us or hypothenar muscles. Sometimes there is subjective sensory disturbance in the tips of the digits but usually no demonstrable loss of touch or pain sensibility. The patient is usually middle aged or old

Hunt 1909 1911 described 3 cases and re garded them as occupational palsies due to re peated firm pressure on the branch to the thenar muscles at a particula ly vulnerable po nt where it turns forward over the lower border of the an terior carpal ligament. Wartenburg (1030) chall lenged this theory because of its incompatibility with Saunders finding that the median nerve moto branches are nearly always covered by a slip. of muscle either flevor or abductor pollicis brevis

Marie and Foix (1912) in describing a series of cases of isolated muscular atrophy of the hand mentioned one which tallied exactly with those of Hunt but they ascribed the cond fron to syphil s since the patient had lightning pains in the leg and the ankle jerks were absent. There were no other signs of central neurological disturbance Late (1013) they pe formed a necrops, on a pa tient suffering from a similar paralysis unfortu nately it had n t been possible to test sensibility satisf ctorily since the patient was over 80 and hemipleg c They found a neuroma on the median nerve just proximal to the anterior carpal ligament and a constriction of the nerve trunk be neath the ligament Histological examination of the neuroma revealed a decrease in the number and size of the myelinated fibers and a noticeable incre se in the interfascicular c nnect e tissue At the site of const ict on there was gross fibrosis within very small bundles and distal to this com plete degeneration of the fibers

Brouwer 19 o recorded 15 cases and favored a phylogenetic expl nation. He suggested th t From th Departmen f Orth paeds Surg ry (P ph al

the thenar muscles being recently acquired char acteristics are more susceptible to trauma and under adverse conditions more liable to undergo degeneration than other muscles

Harris 1026 mentioned wasting of abductor brevis and opponens without sensory loss as a complication of arthritis of the trapeziometacar

pal joint

Lhermitte and de Massary 1930 recorded the necropsy on a patient suffering from this syn drome in which there was atrophy of the dorsolateral nucles in the sixth and seventh cervical segments of the spinal cord

Dorndorf 1931 described 16 cases all vomen at or about the menopause-a factor which he considered significant. He suggested that there was a toxic neuritis affecting motor fibers more

than sensors

Moersch 1938 who added I case supported the view of Hunt that the motor branch is injured as it passes over the distal edge of the anterior ca pal ligament

Wartenburg 1939 presented 7 further exam ples He dism ssed the possibility of median nerve compression because nearly all the recorded cases affected only the outer part of the thenar emi nence and there was seldom any sensory disturb ance His views are similar to those of Brouwer Woltman 1011 reported 2 cases of thenar

palsy 1 of which had slight sensory loss in the median area and was associated with acromegaly The other a woman of 71 with arthritis of the wrst had a complete median nerve lesion with motor and sensory loss. She made a perfect re covery after section of the anterior carpal liga ment by Learmonth an indication that the paral ysis was due to compression of the nerve frunk He suggested that the nerve may become com pressed by an increase in intraneural connective tissue as in acromegaly or by narrowing of the carpal tunnel due to penarticular thickening

The e planations of the thenar palsy offered in these papers can be summarized as follows (1) pressu e on the motor branches of the median nerve at the distal end of the anterior carpal liga ment (2) phy logenetic susceptibility of the thenar muscles (3) compression of the median nerve in

the carpal tunnel and (4) a spinal lesion



Blt 1 ting fthelt lpoti Γg C f th th

Evidence 1 stron est in f vo of the third hy pothesis yet the cases cited in support of this ien were not proved to be ide tical ith the others althou h there were simil rities. The f l ing 2 cases are presented because they showed predominantly motor lesions only the radi I pa t

it was clea Is proved that the median nerve w compressed in the carpal t nnel

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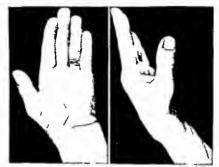
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Bilat ral fra tured carpal scaph d with osteon thritis f rists. Case

ZACHARY THENAR PALSY DUE TO COMPRESSION OF MEDIAN NERVE 215



216

The w d bith it h local control the cash ympt m P thes d p m mpl thy hed with dys fit pet Agut of the rym bid to pll b d mpl t ! If m the moory disturbes

#### DISCUSSION

It has been shown that various authors have postulited les ons of the motor branches the muscles or the anterior horn cells but rarely the main trunk of the median nerve to account for the almost purely mot r character of the lesson and the e clus on of the short flexor of the thumb

The spa ing of the short fle or is easily explained In common with many other workers Hunt 008 recognized that the thenar muscles may be pa tly supplied by the ulnar nerve al thou h Wartenbur did not accept this view More recently it has been shown by Hi het Q13 that in about 3 cases of 4 the flexor pollicis hre s receives part or all of its nerve supply from the ulnar nerve an examination of many more na tients by us has confirmed this finding to in a high p oport on of median nerve divisions flexor pollicis b evi is still acting. That this was the state of affairs in the 2 cases descr bed was shown by farad c stimulation of the ulnur nerve and a similar e planation is likely in the previously re ported cases But it is not surp isin to find that in some instances e.g. Woltman's case and some of the e cited by Dorndorf all the thenar muscles we eaffected since there a minority of s bjects n whom flevor pollicis bre a is supplied entirely by the med n herve

The second source of difficulty in diagnosis is the almost complete absence of sensory disturbnce thi has led previo s authors to inculp te the motor by nches of the nerve (Hunt) the mus cles themselves (Brouwer and Woltman) or the nterior ho n cells (Lhermitte and de Massa y) Another e planation is p sible It known that moderate t auma may ffect a nerve selectively so that one function is suppressed with Ittle or no change in othe s (Stopfo d 026) Recently Sande s and Seddon (unpublished wo k) ha e shown that in t action injuries the la ger fibe sm tor and p priocept ve-suffer more than the maller ones and this dissociated type of lesion is frequently encountered in pe pheral nerve les on from many ca ses

In C, see there w s a mild insory di turb nee at the fin er tip whereas in the other there was no dem instrable sens ir distu bance t all yet in both the site of the leston was und intedly the man trunk. We over ubject e sensory di turbances were p esent in one of Hunts 3 ca es and in 5 of 7 of the e reported by Wartenburg in of which there was demonstrable mild impair ment of sensibility

In patients presenting this syndrome there are therefore good grounds for suspecting a lesion of the main trunk of the median nerve and the possibility of compress on of the nerve in the care pall tunnel must be borne in mind.

The cause of the compression may be q tedou as in the case of the malunied Colles for ture and a number of examples of this has bee recorded. Most of these lesions followed the in jury within 1 or 2 months (Bouilli 1884 Le is and Miller 19 2 Abbott and Saunders 1931) and the sequence of events was then quite clear in only a few recorded cases did it occur has a sequel. Abbott and Saunders reported one et ample occurrin many years after the injury at quoted two others.

scaphoid are a fruitful source of osteoarth fus of the wrist and if there is much pe instructars of any narrowing of the carpal tunnel: ultimateh inevitable Several of the cases repo ted by Brouwer and Dorndorf and one of Woltmann s had arthus

of the wrist

It is poss ble that other factors may prod ce the
same state of affa s but there is undo btedly
sufficient e idence to demand a careful i vesus
tion of the local condition in every case of this

syndrome if only to excl de compressio of the main nerve trunk in the carp \ \text{ tunnel.}

The early release of the nerve by dvision \ \text{fe anterior carpal \ ment many lead to recovery \ \ \text{fm motor power but if the paralysis in dwisting \ \text{hat reco ery will occur since the chas is in the muscles will \ \text{ho to cour since the chas is in the cases presented a very strik \ \text{g in the cour since the chas is in the cases presented a very strik \ \text{g in the cour since the chas is in the cases presented a very strik \ \text{g in the cour since the chas is in the cases presented a very strik \ \text{g in motifs after even in Case \ \text{the asymptons had been prevented in Case \ \text{c the asymptons had been prevented in Case \ \text{the asymptons had been prevented in the inerve abductor poll cis brevis had of eleasin the nerve abductor poll cis brevis had.}

### SUMMARY

Two cases of the syndrome of partial thenar atrophy are presented The p ralysis was due to comp ession of the main trink of the median nerve in the carpal

reco ered

3 The partial nature of the atrophy is due to ulna innervation of flex r pollicis brevs

4 The almost complete sparing fise sory filers is p bably due to the selective action of the

#### ZACHARY THENAR PALSY DUE TO COMPRESSION OF MEDIAN NERVE 217

trauma affecting the large fibers (motor) pre dominantly and producing a dissociated type of

5 Division of the anterior carpal ligament is suggested as a means of relief

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5 HARR W \ Numb d h g L d C

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7 Hent J R T Am \ Ass 909 3 84

8 Idm Am J M Sc 9 9 Idem R eu Pyh Idem R eu Pyh t Ed 94 37 Le Ts D d Miller F M T Am S g A 9 4 489 LERMITTE J dor Massay J R ne P 193 MARIE P dFrx C Vu or de l S lpêt

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8 WO M H W Arch N Pychiat Chc 94 45 680

# DECIDUAL REACTION OF ENDOMETRIUM ECTOPIC IN AN ABDOMINAL LYMPH NODE

HOMER B RUSSELL MD Ch g III

28

ASSES of tissues with the structure of endometrium heterotopic in pel vic lymph nodes have interest be cause no theory as yet seem to ex plain their formation. The p oper identification of these heterotopic tissues 1 somewhat in doubt when they are found in the quiescent sta e and only general structural s mula ities are a a lable for compar on vith uterine mucosa. Specific physi logic chan es such as a decidual reaction of the stroma cells in these heterotopic tissues simplifies the identification Emil Ries in 1897 de scribed gland ti sues in 1 c lymph nodes and concluded they were remnants of the Wolfban body alth unh he mentioned their similarity to endometrial glands. Wertheim in 1000 reported gland structures in lymph nodes which at first he believed were metastat cf man adenocarcinoma of the cervi. Later he revi ed thi view when he observed sim lar gland ti sues in pelvic lymph nodes of patients dying from noncancerous disea es Descriptions of these heterotop c tissues by Wuelfing n 1001 Manteufel in 1004 Mever (27) in 1909 and others i ere interpreted as metastatic carc noma Some belie e these structures arise from lymphatic endothelium Schindler in 1906 su gested that these heterotopic tissues of lymph nodes may be d splaced endometrium and Geipel in 1016 described decidual e ctions in them 11 studied pelvic lymph nodes f om the bodies of 3 women dying from complications f pregnancy and found the endometrial t ssues most frequent n the hypo, stric and less often in the sacral lymph nodes The foc of decidual cells were found in the capsular a d cort cal portions of the lymph node usually s discrete foci and as large as a lymph follicle There w s either a single large mas of ti sue or mult ple small foci Ge pel observed multiple glands I ned by cuboid I or c lumn r cells and c ucluded that they we e dern tives of the Wolffian duct. Mo e recent reports of hete atopic end metr in in pelvic lymph nodes were publ hed by Halban Hosoi and Meeker 19 9 Hansmann and Shenken 933 and others Schiffman and Seviert and Pol ter stated that the on I distribution f re fS Lk H

hete otopic endomet m usually concided when the location of ectopic decidual tissues and that the incidence of these two conditions dece sed as the distance from the oran increased. Acc digit to Me is the stroma cells of about half of the better that the stroma is stromated to the stromate of the other than the strong cells of the other than the strong control plus solo in changes in the same heterotone location.

Gland like structures have been obser ed also in lymph nodes in the avilla the neck and in the parotid and submavillary regions by Sternbe g Carere Comes and others

A gree ged 34 y rs died in t aft dmi St L k II p tal. The potent meanur is nest tot the case for the highem pe um B dit the lift of the true, mass des nos td mass f h m h th po t f hi h d p d t ruptur df t l sa w th rumpl oth f6g tm t tthdby morestm I gth f imt dam lim tr d m t m t t the hor man t es The lite t fth m tad rplitum fpgn y men mut Thitfiflip the 1 dufed ri am hg tu Thinghtfil p the dir bodt thinkaged tru Thinug ith tus undom t This m plgy d Hetmppt d t milmates ibkess f m th h m mbg m fth m d b db t the home how d tddlt es and d 1 1 d t i lymphocytes bo dt th fb es w will fth tfiflip ib I ise t as pet lymph od h d by tall i m decd i ti es (F os ta d th 1 p th h m đ d ) 4 th 1 bul t ffb med llary po t

No set sfactors expl aut in has bee offend! it these heterotopic endometrial tissues with whoth deed that leach in See eral theo 1 has been proposed Von Reck! Inglausers in 1896 set of that aber in denorstomas de dyed from remmants 1 the Wolff an diest a dithes he also bee cons dered as p tent 1 preceded that these tisses ed deel p fr m lumph t contributed um or regional el ment in the pels s f om a chone 1 flamman in the action 1 cance as tisses 1 a horm nal hid length and 1 the pels special tisses 1 a horm hall mil ence them.



capable under certain conditions to undergo metaplasia and produce mullerian like ducts and tubules. Weller expressed a similar view and stated that the subserous stroma cells of the peritoneum could form masses of decidua about these heterotop c gland structures Schiller (30 40) stated that in early fetal life the entire peritoneum i potentially able to form endometrium but in the course of normal development only the pert neal cells in the mullerian region retain this p tency which may remain latent for years and then a a result of stimulation may be activated and form reg ons of endometrium within the peri toneum Halban Schindler Carere Comes and thers concluded that endometrial tissues migrate to the lymphat cs draining the uterus during menstruati n and are carried to extrauterine locations Sampson (33 34 35 37) has proposed that a retrograde flow of menstruation prod cts occu s The cast off viable endometrium he stated is implanted throughout the pel ic peri toneum According to Sampson en lometrium s d splaced also thr ugh venous and lymphatic ch and mo e frequently by the years th'n the lymph tes Goodall believed that end met um becomes avasive as a result of faulty o arian se c et o but stated that lymph id t sue nd tissues outside the pelvs are unsuitable f growth f hete otopic end metrium H O J nes stated that these beterotopic tissues may come f om e the the uperficial to o-thirds f endome trium or the basal layer and that specife physiolog c changes occur more readily when the more respons e superfic al layers a e in ol ed Pos

sibly some of these heterot nic tiss es may be

der ed from celomic epithelium is potentially

mo e immature than others and hence incapable f functional activity and decidual reactions occur in stromal cells of the heterotopic endome trium only after functional maturity has been reached.

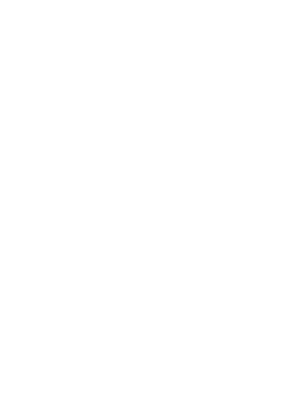
Gland I ke tissues a lymph nodes of the mesen terv near the pane cas in the neck, and around the sali any glands according to Carere Comes may come from embryonal displacements of tissues. Sternberg said if endothelial proliferations in lymph vessels lead to epithelium like for mations it would be difficult to believe that such a transformation should confine itself to the border sinuses. I flymph nodes without changes in the endothelium elsewhee. He concluded that epithelial cells of mithesighands migrated through tie lymphatics to regional lymph nodes and for med small glandular inclusions.

#### CONCLUSIONS

Heter top c endometrial tissues vith decidual reaction of the stroma cells were found in rpelv c lymph node of a woman v ho died from the hem in ge caused by a ruptured extrauterine pegn acp.

The decidual reaction of the stromal cells in these heterotopic tissues indicates that these tisses during the term of pregnancy have the physical logic changes of endometrium in the uteru

3 Of the theories pr posed as to the origin of heterot pc endometrium no e as yet has been accepted generally Probably the factors in volved apply also to the origin of glandular structures observed in hymph nodes in other regions of the body.



#### EDITORIAL

### SURGERY Gynecology and Obstetrics

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Do ALD C BALFOUR 1 crate Ed 1 1 St ff

AUGUST 1945

#### GASTROSTOMY

ROV a survey of the large number of perature techniques developed for the performance of a gastrostomy one might gather that a large field of usefulness custed for this procedure. Undoubtedly the most common lesson for which this operation is performed is a carcinoma of the esophague especially of the middle third where the majority of these neoplasms are located. Our experience at the Cook County Hospital has given us reason to reconsider the entire problem.

We have reviewed the records of 80 patients on whom gastrostomies were performed be tween 1941 and 1944. There were 72 males and 6 females a frequency in females higher than that ordinarily reported. The ages varied between 51 and 81 years. The classical symptoms of dysphagia inability to retain helpids and solids and weight loss were uniformly present. Of particular interest was the average weight loss of 36 pounds in this scenes of patients. This implies the loss of 16 ooo of patients.

grams of tissue the most important fraction of which is tissue protein \(\lambda\) ray examination or esophagoscopy or both usually have demon strated the lesion before operation. The mid dle third of the esophagus is involved most frequently the lower third next and the up per third the least frequently. Almost one half of these patients show a secondary ane min when admitted to the hospital. It is certain that the incidence of anemia would have proved to be higher had blood counts been repeated after dehydration had been combatted In another series of cases pre viously reported in which patients required various surgical treatment an incidence of hypoproteinemia of 23 per cent was found Hypoproteinemia was considerably more fre quent in this group of cases here again the actual incidence would have been still higher had dehydration been taken into account

The usual preoperative preparation con state of the use of antispasmodics liquid diet where po sible and parenteral fluids and vita mins. Twenty six of the 80 patients received blood transfusions and in no case was more than 500 cubic centimeters given. The operations were performed by several members of the attending and surgical staff. A variety of anesthetic agents were used local anesthesia or intercostal block, was favored. Average operating time was slightly over one hour. The types of gastrostomies performed in cluded those described by Janeway. Witzel Spival, Thorek, and Glassman.

In many instances the gastrostomy was per formed with the hope that resection of the esophagus could be accomplished at a later date actually resection was done in only one patient and in this instance it proved to

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# International Abstract of Surgery

Supplementary to

Surgery, Gynecology and Obstetrics

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### ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

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bing accompaned with meningits whereas the subdural air is more apt to follo fractures through the p terior walls of the frontal sinuses. The a r in th b am substance or entricular system depends o the e tent of adhes ons locat on f the fractu e nd am nt of e t rnal pressure. It is often asso c ated with subd alar It i interesting that pneumocephal as a rule

d v lops after a lat t period of sev al days to sev e l mo the Da dy called atte t on t this fact n o 6 hen he repo ted series of 4 traumatice s s In ly 6 of th was there ap cum phal shefor o e w k 1 3 it o u red hefore e m nth in 1 betw n fou nd s weeks and n s at l terd tes th l test being aft r t n mo th The reason f r the snot clear b t the autho s re under the im ion that the hem rrhage a ded ma which im m diately follo the trauma p event the passage of





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Sn Il A C J Prf rating Oc 1 Injuries 1m J Ophth 945 8 63

In n aly s f 72 c s s f perf t g cular nj es which cold be fill dove pod of t me the author f d the foll w g fact rs and complicate s to be f mporta ce th pat nt the agent cau 1 g th 1 j y th 1 gtha d l cat of th laceratio th nat ddg of pr lapse th d me f pr lapse th d gre f dam g to th 1 gree i ntra cul r h m rrh ge th ccu nce i le to th pes ce or hs ce f t ed tra ocula for ign bod a a d the cour

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l de inj res by hl t bjects d hl perfo at f the globe eve ed g es f pr l ps sever ocular h morrhage and 1 tra cular infect on

The incidence f sympathet c phth lmia among these cases was I 45 per cent Suggested s rg c 1 ntervention included renair

by means of conju ctival flaps c r eal sutures or both He TE H ROMAINE M D

Bnd MB and Fulw LT Viual Ditu b ance Prod d by Blisteral Le ins of the Occipital Lobes with Central Scotomas A ch

Pay h at Chic. 1045 53 65 The case of a pat t ho sustained bilateral gun shot wounds involving the occ pital lobes of the b in in a fairly symmetrical fashion is reported This patient was completely blind for a time and h subsequently regained in a grad al fash on a ce tam amount of pe upheral vis o He had bil teral

central scotomas which remained permanently Caref I observat one of the pat at a recovery of vis n were mad with refere ce to perception of light movement form and color as well as other sobi et ve visual phe omena and o ientation of the fi ld of vision

The first visual funct on to return (two days aft r 1 1 ry) was to t of light perception and 1 ith this was associated dislike for b ight light and it was f ter observed that the patient c uld se better in a dark room than with adequate ill mi ation Becau e of th loss of ce tral vi ion the patient w sday blind In this condition the per phe al portion of the ret a responds better t low ill minat n than to h ight

hght Perception of movement followed ve ys n a d the is o e of the bette functions of the periphe al

po t on of the retma P reception of form is based on v s lacuity e pe nene and a terp t ton cons q tly witho t ce tr lv sio this patient had v ryl tile pe ception of stationary objects. He was able to terpret t ome e tent movi g obj ets in the pe ipheral field part cularly f m l objects and e p i nce a d

memo y w red stinct a d P cept o of color was slow but after five mo the be was abl to reog user d gen and blue neon s gas-appar atly the result f an island of color vision in the right homonym s s pe ior

qadat The patient and u d to av id b ght lights or avoided fooking d ectly at b ight objects to do so p duced a sensate of heat way s b fore his eyes with an increas g haziness which i terfe ed with

The patient was not awar of the entral scot madesp t repe t d test and di cu n with h m co cerning the loss of c tral vis n ff co tinued to ms st that he wa abl t see objects di ectly before

him and h stat d that e cryth g before h m med of mform vi ual te sity This sa no mal mech n sm of psychol g cal filling in of vis al fild d lects and objects are this pe cervid as a

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HOWARD A. B OWN M D

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TOSHU Z CKERNA, MD

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#### NOSE AND SINUSES

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This see indary vasod'l tation is influenced mainly hy th type and amount of the drug employed and the sens tivity of the individual vasomotor mechan 1010

The addition of antis pt cs partic 1 ly sulfathia z le s luti s to vasoconstrictor drugs i creases the rnt t pr pert es with ut compensat ry th raneu fits tic b

I d cio s use of soconstrictive med cation is in d cat d in surgical manipulati e a d d pl cement procedures and in s m acute n 1 infections

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The indiscriminat use of this med cat n in acute rh nitis lengthe s the c urse of of ct on and in creases the c dence f sin s and otitic complica t Ane

Vasoco strictor drums m y of thems ly s produce a vas moto rhinitis ind stingu shable f om that due to alle gy Vasom to the etts allergic n origin as made more severe hy o st cting med cat on The se of vasoconstrictor drugs in home oh

pathol g cal co d tions adds the factor of a co d ry co gest on to the obstruction already TO V F D PE M D

#### PHARYNX

IIA Bodin D and Wnnr IIA FrthrObreatin on the Pence of Polio my litis Virus la th II m a Oropharyn Bull J h II ph ns H p 945 76 9 Observatio s on the ec very of poli myelitis

virus from the oropharyna a total of 16 cases are po t d Swahs we taken from patients with the d se in the sp land hulbar pa lytie a d n paralyte f rms. The swahs were moiste ed tilled wat rand fo en on carbon-do ide ce Tests were performed by el ting the m terial f m the cott n in phosphat b fle at \$118 the el ate then h ing brought to pH7 a dt eat d with ether (20 pe cent) n th ie hox u til te le (f om eighteen to th ty x hour ) at which time th ether was re mo ed

Th inoculum which was always ! than 11 was g en by 1 trace chral 1 cul tion into mo key The crit n f successful is lat of the virus we e the pr ducti n of flaceid pa als s w th typ calles o si the sp nal c rds a d the p d ct on is dubitable les ns l ne (1 case) By this method th vrus was fu d to b p se tin 43 p c nt ol a s ri of 23 cases f on which the swabs we t ken d 1 g the first thr d ys f illness N wrus w fou d to be pr e t n 13 ca es after th thi d day I ıII ess J n R. Lrep

#### NECK

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hazard th y tried this drug in sp ial cases exhibit g varying complications and a fa lure to respo d to odube

C se I was that of a seventy year old woman with nodular toxic g t r cardiae decompensation di b tes mellitus a d varicose v i s of the leg. Ov r a per od of s x mo the on a do e of from o 4 to 0 6 em I thion and the hyperthyr di m was ent rely cont olled and the diabetes and cardiae function re markedly imp oved

Case 2 was that f a woman aged fifty five with hyperplast c go to nd card ac decompensation cas 3 a wom n aged fifty 1th hyp pl stie goiter a deard acfalur nd case 4 a w man aged si ty two wth nod I r got r di betes mellitus a d dab to etinit All thee of these patie is were the benefited with from o at o 6 gm of th u aeil

d ily each req 1 ed ca eful regulati n

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E ton J C Th Treatm nt of Thyrotoxi osls with Thi racii L ! Lo d 046 68 171

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In 1 of 4 di bet es the diahetes we pamary a d th e pat e to all esp nded well to the racil One f them de elop da gast ointest lup et with nau s a vomiting and ev e keto s three weeks aft thiouraclt eatm nt w s sta ted but the drug w s not thought to h esponsible for th s in ident as the pat at rec ered very rapidly when given e tra 1 ulm glucose salme solution and a s table det ac I be geo tinued meanwhile The da b tic in whom the thyrot icosis was the primary ds e was the nly patient wh failed to respond to th n el

In this se ies very f w toxic effects of th ourac l we e seen. The te d cy to ard I cope is was usually followed by a rise in the white cell count e c tho gh the d age was n t reduc d The auth rs pe sence and cates that the ur cla fi ctives the tment f thyrot acosis wheth r t be p imary

condary or recurrent after oper ton d n mas seem to espond more sl wly t the drug The sin coard ce with the find go of other est gat rs

O th has s of th a cases treated dury g pr g a cy twoulds mth tth e sn co trand cat n to is use except for the possibility that it m y p

duce n enla ged thyr d gland in the f t s It i suggest d that th ilb pl dhyidine ome eks biedliery Foptiets peviouly t eated with iod ne fa led to e po d to thours ilf r ev al w ks aft r tr atm t was start d Th t lds has u lly be n 600 mgm d alw with the mainten need ge ray g n the e gef om co to 400 mgm It wo ld eem th t the to ic effects f th druggar d t rd sag

B VI MIN GOLDMAN M D B ochne M rt n n k nd Uhrbrand H R xam nation f P t ats with E phth lml Treated Con rv t ly 1ct md

944 7 5 3 With the proof m 93 t 94 9 patents wr tre ted fo phth lm g t n th k m H sp tal Cope h ge Eghty f r w teat d n ret Ivand of the 4d d f t curent dias hinth hoptided diftriber dich gifm the stite Th g 75 p tent r am ed the m

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J FR K NARA MD

#### SURGERY OF THE NERVOUS SYSTEM

#### PERIPHERAL NERVES

Ibáñez J S Study fth My n ural Syn psis E perimentally nd in Biopsi s f II man Mus cles in Cases f Paralysis (Est d d la psi ral xp ram talm t y b p s de m s h m p rahtu ) C g ap leo h m m for 944

In studies of ant 1 poliomyelit in ce were in oculat d with the Sk. tra n of poliomy lities virus adapt d to mice hy Jung blut In ome cases it a I u d that there wer no lessons of the se tor of the med lia correspond g t the paraly d muscles. Ther were marked ch ges in the mot pl q es f the p lyzed muscles The hist I gical findi gs are illust ated. They showed dist tegrat on of the motor arbo izations of the plaques There w r n cha ges the sensory t minals

I the study of the egeneration of the fibers pigs were u ed a they d not uccumh to the

ds ase R ge crat n f the fibers wa I u d These studies sh that p ralyss f ce t l ong n due to destruct on f the n e cell of the ant 1 r co d of th med lla s 1 ep rable but paraly is of pe iph 1 or gin due t chang s in the ery a borizations f th motor pl ques s repar able It was al f d that the efroms of the d sease with both f ve a d par ly s I ms with fev but without p r lys s nd forms with ither par lys s that i f ms in wh h th ds ase is of apparent but the i did I aff t dact as ear iers. This e plains the appea a ce fith d eas in altdcaes the thae ppa ently net be in contact with the viru This is of great mpo ta ce th study of the d case

m ning the the organs of th h dy th y we fo nd to sh w typ cal ch ng s wh ch l ads th uth t blies that th d seas 1 a v rem a that s that the v us invades the blood and s carr dt

th differ tog s

Nerves i om cases of h ma paralys s we e lo tuded and illustrato of the hi tol g cal f dings ar g en Smirch ges were found nth a b rizati s which the author heliev xpla s the r c ery of fu ct n in the cases in which th d as shows a favo able c urs

EY G M AV MD

#### BRAIN AND ITS COVERINGS CRANIAL

NERVES

Den y Bro n D Di bility A i I gf m Cl ed H dijry J'Am W 4 945 7 4 9 A study sm de f oo cas of c l n head 1 Jury

da a alyıs fom v rı u tadp tsıs Two hundred cases w e s l cted t of 43 con

secutive adm ss ons xclud g pat ts und rafte

years of age and over fifty five as well as vagrants and chronic alcoholic add cts The major ty were derived from traffic accidents nd relatively few we e severe consists g chiefly of clo ed head in jury with varyi deg ees of scalp wounds a d

vary g lengths of unconsciousness

An analysis of the symptoms d ring conval scence revealed that 55 per cent had some symptomatol gy Th symptoms included h adache and dizziness as well as psych atric symptoms The d sahility last d from two to n ne mo the (o mo e) I llow ginjury The tv nationts were p evented f m returns g to their occupatio s because of 1 j ris ther than th head 1 ry Of the r man ng 170 pat nts 136 had retu ed to full cc pation with two minths-only cheing away f m work f r lo ger than me month Psych at c sympt ms appe red t have th h ghest corr lat n ith p olonged d ab ! ty

P olonged d ab I ty app ared t h ve some rel to hip to log per ds of d sor ntati n abnormal neur log cal gus blood in the spinal fi d and elec troenceph lograph c abn malities n add t on to occupat onal w ies such as an i ty over compe

sat or It gat on

The sympt ms as ociated with pr lo ged d sabil ity whith the ijry was mild o seve e ere p ed m antly m t 1 sympt ms r 1 ted to nx ety li w A B OWN M D

Schw tz II G and Roull as G E Cranices brat Wa W und Ob rv tl n on Delay d Tre tme t t S & 945

The port is b s d n 13 ca if fracture f the sk ll of hich 74 were battle cas lt es and th I fracture f the f m nder we e code tling es The number f open had v ds was small but they ill strated the p oblems th t must be fac d The are 21 case s which s rve to support the conclusi s f th a thors Th r port com from the North

African th ter f operatio s

The early treatm at cons ted of complete debr de m t a d closur 1 l yers without drai age and with ut the local e f sulfonamid s but complet pa of the dura by f scial aut genous t ansplants w mad if t was necessary T napla to for the

d were chita ned usually from the tempo al fase h t om times fr m the fase I ta Compl te deb deme ta d closu without dra nage may b saft factory ven after long del y In 8 cases d b id me t was do after fr m thirty s hours to I day with close without draining and pin mary haling reulted. No arbit ary time limit f

d fi t e t eatment could be set a d furthermor tw ntnces ry As all m d cal sc ence cas must h 1 dged on its m r t Apparently it wa b tter to delay débridem ut ta pl ce where

the was competent personnel and d quate eq pm nt than to g ve ncomplete treatment : the ab

se ce f these f aht es. The n cessity for stand d qu pm nt su h as sucti n sil er clips a d th electrocautery is emphasized

Cases we ep esented in which dq t debrid ment h d b n carrid out t v rying periods f time These h d to b subjected to rad cal d bride m nt and t was p ss ble in ma y instances t d this with tight (s) and with ut drain illust at ve cases d nb d in whi h this w s don at tim intervals varying f om 1 ht to thirty two days following the first inadequate treatme t a d p rtial débrid ment f the w und T ht cl s e s not the treatment f hoc in Meases f that a f surgical judom at but t can b pli hed in me cases

The sulfon m des were n t used I cally as a rul even in late cas but l e d ses f sulfa drugs w g ven by m uth ndp t llv t h ck the bl od

concentrat on

F cial tra plants we e u d to ci dural de fects b tin some f the late cas s th yw n t c essful because of p and c sequ t slo ha D fficults with f so I tra plats at p rts 1 ly lk lyt dv lp whnth nadequate dehnd ment Th p claim f op n head wu ds w th l inam das in gauew ddu sutbl With gard to i mbd mtalleminl

was n t o de ed s c nstant o a d when n t access bl t was l ft n pl ddn tapplyt the form he ds Id fram tand pecs of clothin and of hr we pricul h l hl t poduc fect o m ved mplet ly
The t tm nt f cerebral h m as was c nserv
at a d sist d f c mpl t d h id m t w sh

g with boric solut and dres with as lin lumb punt eo ll fthe m th d Th uth rs rt le should h f int est t ll the who lklythyt deal with njuries l this type I thi thate of perat t pp red that train dipersonn la d diquat quipm nt we mo mportant th n ca ly perat esp lly i th t t nm d f rimp rfect d bridem tof th w nd The diteatment vryealy deal d brid ment with all the fa liti f fully train d

pers n el d'emplt euro gical quipm t ADRIEN V UCCREY M D R wboth m G F nd Ogilvi A G Ch nic Intra rebral H m t ma B t M J qs

The clinical p ctur fa p ntaneo bara hn d hm rrh g su lly a lly ecogni d by ve had ch with with tiss of co sc s nes nayoung middl dp vauly h lthy and vid 1. The dagn is thin vin id by th p ese ce of blood in th I mb h p I fit d
S ch hemorrha es cc a z esult of co g intal a
eurysms d et a w kness th in th mesoderm l vascular layer at the sit f jun tion of tw ves Is r from a stump r mn at i primitive vess l whi h has not complitely disappea ed

Alth u h most f these an urysms rupture mis the s b rachnoid spac som become adherent to bral corte a d h nce may rupture intricer b liy If the pat at survi es the cute episod chr nic ntra bal h m toma d el p T quite s m la ca p s nted as e mples of th latt g up B th p t nts had a complete b pleons whi h d v lop d t the o set a dialed to mp p nod of few weeks they contined

to ompl n of h dache and de el ped a econdary

n ntracra i l pressure as evide c d hy p pil-

ledema Desp te evide ce su gestive of recurrent bleeding p ated lumbar punctures f iled to reveal a fresh suh r hn d hem 17h ge. On the basis that this wa ninta hrallesin risi from them id reh l rt rv ts bra ches th t n r ren a of the yl nfi r was plo d by a myople be t mv

In both ca a cystic h m toma was fo d-on p temprl grad the other in the hemat m n temly pd recory f m th ed a d b th pat t ha returned h m ple≃i

t a rm llıfe The these I d that the h miple award t p u p th middle bral rtery rathe the ponth rt p thwys an the cory n s rapd Th is nt ra lpre ur s

pluned by n c It dI man nf ff dd t th esed m t t so f ll wi th hreakd wn fth blood It It was hi ed th t the d gers f tt mptig t expo and lgat rysm the d pth ith e nw t grettwrrants hapr how wir the co few cutn the cot sud hi O the th hand th authors d bt th tu ry ham cht fin the te tment f o din ry popl xy n fact in the ly ta es of c h lhem πh d to yeas

I CK L WOO UD Sweet L R. Durn ff St nley E D wli g H. F

nd Lepper M H Th Treatm t fP cocci M ningiti with Penicillin J Am M A 945 7 63

mo cci m ortis s pp e tly ryres ! tt Ufrm ftetmet Idungs If md th rapy Fifty caes ith da ed used m this it I som I which we een d treat d
privat p tee thers we dmit d t t
Gall Muncp ! H pt ! Washingt D C betw n July 91 and A out 944 Upt De cembr 1943 4 pt ntsw tre t dwth th! sulfaduazin r sulf m raz with the add t n i typ pecific nt pn m coccal rum in 2 cases Sin D cemb r 5 943 p cillin b cam a lable ds ce then 6p t ts hav b t td I th first gr p fpt ts whm pe cill w us d th w 37 d ths wh as in th grop 6p to ts tr ted with pe cill d the forms of th rapy th we 9 deaths T bles how to

the sun I flu d fi d as the source of the disc te tm nt a dthe gene le urse of the d se se The pe i ill treated gr up ar all i clud din e e table In the pe willin t ted group treatm t vas n t always alo g identical lin 3 patients received peni

cll n both 1 trathecally and t am sc l ly hut ed no sulion m d s with 1 recov ry 5p tients d pe will n trathecally and sulfam razine or

with a recover s 8 p t nts r i d p call both 1 trathecally and intramuscularly and

al os lio am des with 3 reco er es

Re ct o s refe able to the lumb sac I part of the spinal cord were noted in 4 cases in cases there were pain and weakness of the legs and back and in 2 cases there was paralysis of the legs with sph neter disturbanc s and unnary retention Reco ery oc curred in all the cases after the withdrawal of the intrathecal pen cillin Recurrence of the symptoms took place hen the p nicill n was stopp d too soon Teatm tws continued fom two weeks to one hu d ed a d eight days Ce ebral atrophy occurred in 2 p t nts in wh m the drug was g v cerebral entricle but whether the at ophy w s due to the p nicilling to the pneumococcal meningitis was of determi d Beca se of these u toward react o s whe the intrathecal admin st at on of pen cilin is long continued an attempt should be made to shorte the nece sity for its u e hy g ving penic'lli system cally a d by g ving I ge d ses of

Hadiazine and a Ham raz ne AD TEN V B G REN M D

#### MISCELLANEOUS

S nd l nd S Th Blood S pply of th N
th Upper Limb in M n A h \ F Chic 045 53 0

Sund land has u d tak the st dv f th mal d stribut n of the vasa nervorum asres f 37 adult arms 8 of which we pasted Th stra neural feat res of the asa n roorum we e ami d by gro s d sect on whil th intra l a cular p ttern was e am n d 1 m croscop p p at ons as well The struct r of the vessel a d t the ize

as the s le bas for class ficat A capll v 1 d fined as a ves I with a all m de p end th I m Ap capull ry arte I h add m tel layer form t to th ll tbck outsid the end thelum In arte il h s endo th I m surr nded by a t nica med a mpo ed pr d m nantly of smooth muscl a d th tu 15 s re nded by t n ca ad e tti N th g larg than na teri le was e n in the m cros pc c t as The potcapell ry veles and thid b the I g I men a d v ry thin walls c mp s d p c pally of con ective to u dat ce of smooth m s le

All ves els which e te the nive dit minate trae ally are egadds t t tres (a te e n num) The ess 1 com gf m the ma ess 1 of th imh or f m its m db a ches d wh chs pply th nerve excl si ly e called d rect.

which th

D gram Il trat g th m nn tv rum beba as th y pp oach establish tat with the new

Those nutr nt es 15 which come f om bra ches desti ed tos pply ext a eu al t sues p cdomi antly are call di di ect. The latter are of c mmon Ea h 1 di idual n rve is supplied by a reaso ably

c astant group f tenes but the a mber si e a d p ec or gin of the a te ise n rvorum vary iderably n t nly from ind vid I to i divid I b t also from e ide to the oth Certain regions h h tually are the t f m which a nine receives to utrent vessel uch as at the elb win the case f the ul ar n re a d in the piral groo e in the cas of the rad | nerve Th | gest nut lent vess | diss cted in th rm measured 1 mm the smallest was the dil Ne es run c d ble di ta ces without receiv

tie t ves 1 Thus th medi n and ulnar rves we e fr e of enter g vess is h tw en th lla and the lbow no ishment ver this length of ree being p ovided by large t a eural chan n is Ho e e to g nerally difficult f ane e form to surrou dang tosues for mor than a f w centum ters with ut's crifice f me f the vessels pph g it The siz of the first branches to e ter we appears t determi the ub q ent si e

mher f the b anches e te 1 g it t m e d tall els The la g these first es l the larg nd che s the t neur I chann I and th I ng the ple us will be m i ta ed h for re f c m t b comes neces ary The pe o ly ep ted f ct that the pro im I portio of the n rv ec es more

l ge and lo ge n t ient a teries could not be con firmed On the othe hand in about 50 prent f th ulnar news xam dithe was an ner as m the number feel pplying the distal p tons This was e howeve in the case of the median

The rv rum a e generally short from to / 1 ch in l th O cas onally part cularly n th upply of the m dian n r. f m th ďĺ t y baches up to nch nl gth pese t The ves el tak th mo t di ect co rse to the nerve nd are ge e lly t a ght o gently curv dandente th n on the p nt gasp ct Occas ally a recurre t twig f om m cul b h nt is th n rve n th asp ct oppo ite th t t whi h th t nut tent t es we e enters g. The cours mot fr q ently th supply of the media and In nerves n the f arm

The bh var of the try or ach g the nerv dagr mm t cally rep esent d n figur () the ve s I may plug ta variety i gles mm dately t the ves el ( ) t may run de tally dith nice th erve (3) t may run al ug the ra g vang off p n trati g vess l nd th nl av (4) th n rv may upplied f m an te il p (5) th n t nt

arte y may di id no bf racb ng the
(6) occas lly nart y prf t a ve l w th with t supply gith nerve (2) occas on By a vessel trthe nrv at the mlvl

The nt nural velaptt neempod f 4 y t ms of v ssel p ll with the l g t dinal of the nerv The p usel v t m comp d farter lop capill swith few travers bloue astoms Th tefasc larat 1s f ma ndl g t din laystem f m which t n are d rived l g tud n lly dispos d ) t ms of capillary ndpecapillryseds is in the d in the fasc cul N 1 gl es el ne um dom nated the 1 t e 1 patt m e th ent le gth of th nrs Myr nt ral ch nel i lly placed by wlye t ones gm nta e g

g te l as th nerv descend Occas n lly n b th the case of th uin rand th median erves a lg esslon th inn r urfa f th nerves has b nob rvedt descend fom th a ill t the lbow without t rupt o ralte t n of pos tion The sag n ral t nde cy f r th largest intran ral ves I t be rrayed t wa d th cent r f th nerv n

thei erm and t wad the periph ry in the rm A cha acte t c featur of th tr n ural vascul patt m sth n id abl lap of upply b twe n n t at trees at rung told the etwild emith to ves leanb dt supply a p ecise and discr te egm at fa rv During the tudy n rv w e f eq ntly strpp d t prati n fall rrounding coan ct n f d ta ces upt r cm y twh n th n rewas dviddds tally the cut and f the f ed egm t at dt ble d p of ly This d monstr t d the rich ess f the ntrane ral ast moses

V nules we the l gest v n us ess is n m nerves and leaving th m The intrane al te u p tterm corresponded n ge e 1 to the a tend at geme t Larg v s f the deep rves general te mi ate m scul v s ho v it s not ; communts I ge m gigve s tengpr e pal v s le sof cutaneo nerves also g en d n tom cul e beneath th deep facs lth gh d n ge into the bcuta y tem 1 ot u commo

The p inc pal blood pply to the m da pen in the uppe a m comes f om the ax llary a b ach al arteries In the cubit I fos the ner e e es ts supply f om one e 1 f the art no lat dt t n th region I th fo rm then s suppled by the rad at dul t es d'pro op By by the med n try who per t(t :

pes ta 7 f 37 pe mens) The ulfnive i accomp dithoghotal corse hyacto that dened tun form thax llry bhalln elltra spatochl r postero l rad l art e The little tw vessel gv th p coladmo

sta t pply to the ul r nerve The di rve; ppldbythallrysub scap la h hal and p fu d b chu t nes thail darmhfr t trath p lgoo hy the p f dab chi a tery while i the groo d by th a astomos s betw the p of da no th a le rrd l curre ta tery hl 1 th tram cula frrwb twe theb hi m d m d lly a d th bach; d al d the ten carp dal logus m l l t ally Th ma

pply mot cas 1 bta ed fr m th p of d This pifial dulerv s pplotbyth t o rad I recurr tad adulat es o th ha he The post no tros u erve sup plied by that radi l recurre tad post nt os u tries doccaso lly by the a t ro 1 the d tal th rd of th at os io arm

The m dian rve sally reces me ad large n t nt ves el th pp a m th m th I e rm Th ul n rv ce es mo e es bin the form than the rm in a mall maj ty of cases How we the es el th rm a than the n th fo rm

HENRY A SHEVEIN MD

P ppen J L Th H rni t d Int rv rt bral Disc An Analy i f 400 V rifi d Cases N E tind

J M 945 3 the pre ts n aly s f 400 enhed ca s of hermat d 1 t rve teb 1 discs wh h were s n ver c ree of ten years in th D partment of Neu log cal S g ry of th Lah y Clin Boston. Thr is nod cus on I mparaty reo tmpob t c lientan ly is f th 400 cases is given These cases p esent niy 8 p reent of the p tents wh p es ted them el es t th Clinc in l wbackach sei t ca or b th Sciat ca was present in II I thes pat ts cpt d the most co" stant operat ve fi d g was post e straght | 8 s gn The author b I eves that this sign would ap pear n 100 per cent of th cases with 1 tervertebral discs at the third f urth and fith lumbar segments provid d they were ami ed in the ac te phase of In difficult cases ovygen spinog ams the cond to ere made Od narrly character st c findings of a he rated disc were not oted in the ro ntgeno-

po ted out that conservative t eatment should b attempted especially in the cases in which there has not be n p lo ged d sab l ty or prolonged pain whereas in cases in which the pa n has caused ser us d sability and economic loss operation should be u dertake W th r gard to the questions of should b rm ed and heth r the disc al wh ther a fus o sh ld be added it is believed that s a long h tory of predom at g back pain as c t d with abnormal facets a d n unstable back the p tient should b gi n th b efit of a This is ad able p rticularly if the occupa of the patie t co 1sts of heavy manual labor thor is f th opi io that t o ly the h mi ted loose part of the d se sho ld b emoved

b tal o degen ted dise t s e The relief fisci tica was satisfactory in most of th cases but in almost half there was res dual back miort o beavy ift ng or hen s tt g This atu tion was not mat 1 lly imp ov d 1 the pa tie ts (opere tofth seres) who also h di o s 15 p re nt f the pat nts d d not obtain any rel ef of the pa n

Atte ton is call dt the pos ibility f mistaking fra tum of th cauda equina a d to the f et th t 6 patients n th s ser es had dev 1 ped com pl te parapleg a as the re ult of mass e e trusion of ADRIEN VERBRUGGEEN M D

Ky J A Th Conservative and Operati Treat t f Le ion f the Interv et bral Discs in th Low Back S g y 945 7 9

This interesting art le by a orthoped e surgeon pres nts an exh ustive tudy of the ca e a d tre t m at of patie ts with low back p 1 It is b sed

upon a series of r consecutive cases which were operated upon for ruptured intervertebral discs in the lumbar region as well as many other cases which were treated by cons rvat ve means. The history and physical examination were the prime factors considered in det rmining the type if tr atme t to b gwe the individual patient. It is emphasized

that conservative m n g ment b att mpted first and only in patients having a history f prolo ged d blity and n r l f from conservative treatment should operation be considered. Rout e roentg n

ams of the lumbos e al r g on were taken as c n firmatory evidence of a disc lesio and it was noted that i eque thy even though a n owed space wa

n on the ro ntg nogram the d sc l on was not necessarily at this space but m ht be in a spa which appeared n mal in the roe tgenogr m So ograms were not taken As a rul at least t o d c spaces were expl ed

For the purpo of treatment p tients were class fied as ambulat ry pat ents bed pat e ts and perative patients The group of ambul tory pa ti nts were treated with suppo ts with or without saeroil ac pad espec ally supported beds were ad vised and in some cas s manip lations were em pl yed Bed pat nts were treat d by plac g them with the bead a dinees fie ed and the pplication

flocal beat and whe the acute symptoms had ub

s ded the ambulatory treatment was continued With regard to perati e treatment this was a g gested only when conservative meth ds had failed the p otruded pa t of the disc ; as r moved with or w thout curettem at of the nucleus pulposus a d w th or without spinal fusio The ope ative tech n que is very ca efully described s is the treatment by spinal f sion which is done according to the perati e teebnique described by Breek and hy Basom a d Boswo th Also it is pointed out th t

th surg cal treatm nt does not give a co per cent p riect I suit but this rem rk is true in oth r su gical c ditions The results 1 this series of cas s re highly a tisfactory

ADRIEN V B UGCHE M D

### SURGERY OF THE THORAX

#### CHEST WALL AND BREAST

NhmnBAR ult of Tatment of Cnr f th B at t Centrallasa tt t in Bo s Sw d n Act adiol Stockh 943 4 478

The cas s of cancer of th be st t eated at the Cnt 1 H sp tal of B s f om S pt mbr qs t March 91 are vi wed Alf we -e m ed g th c nd h lf f February and n M h 1943 s th p d of oh rvat n was in n cas less th two y is The B 5 cases wh b wred dd1 to thee groups () cases frad cal op tion n which th patients g ven p

op twe o p stop t irrad ton r b th fno d calop t n and (3) n perabl (2) ca cases wh hw g ven only entgent tm nt Pep tvet tmentco td i30 4 pplca tion 1300 entg n (f cald ta e 4 cm filt r

mm f copp r and mm of 1 m um nd ky) to ch of two field that 1 m tsın asın nydays Oprton wasd eth rfrw ks ftrthe nd fth pepe ty teatment Pstop atvet atm ntwsgn lly hegun eo tww kaft pe t n As rule of t atm t w g ve w than int rval tw s f tw m nth net atm ntadyw gyn f eight dy v two filds on anterio do ps tero Th ant rfild w g enfi t atm nts f oor ntgen each (f cald tac 5 cm filter 4 mm f lum num 8 kv) whl the pot no fild was g e 3 treatme ts of 300 o ntg each

(f cald st n e 40 cm filter mm of c pp 2 5 kv) Of the fit grop 48 of the patients wer live fiv y rs fter operat n wth n gn f m tas t sin th b ryise No defin t diff e c in poen sis n th b s of age ld he fou d Of the 8 pat nts in gr p swee he ft r five y rs stll lv aft m y ars a d i ft ten vers ln gr p 3 of the 46 pat tsw lv aft fiv y is hill of th

ded within then the yers F m th figures th tho c I des that th esults e b tt with comb d su gical a d t gatr tm tthnwthethrle a plpblegl d nth п

AUDRE G MO A. M D

#### TRACHEA LUNGS AND PLEURA

Ma H C. nd Klopstock R. Lobect my f r Pulm nary Tube cul 1 J Thorac S g 945

t en cases f pulmo ary t be culosist ated by beb tomy prtd by the thors All pt nts had act ve tub culosis with post v p tum The lob ctomes w d e as p m ry urgical po c d re

A a ty f d cat ons for lob ct m) wer pres t as f ll ws Tsn avtswhchfldtorpodt m th a r n wh ch pneumotho are ld not

bt in d Ap ed m nat ly hro ch I type of dise e pe h p with littl ca tat o 3 Loelb cate not D d

motho 4 E ten cas at o 1 b wth 1ttl ca tat o d w th th d Im ted aim tt

1 be s A brukn detoyed lb with t

cavitat n dwthlttl ndces theata l t ral lu g 6 Unil bar d yugprs espe all 1 th gro 1 g ch ld (Lobect my wa d e pref

e c to the racopl ty ) In the m j ty f th sep t to th d

in th q i t t g alth gh the re gas l
ct ty in som s hown by a lght f c ased p ls rt and n; ase; the dm ti tart Oly pt thad large amo t! p tum ad the oeddf m pd Bohald swpsnt htb ch pydd th la tth ste twhhdv fth b 1 atted as f th b ch

d All pato wred withthis dulhir t n tech que d'gre t stre s pla d pui th t h q e Int tacheal anesthes a wth g eth 13 ge w dalth gh me fthe lyop t ns n do de cy lop p The su g al pod swe cared utm teulo ly d ave age p d f fo and ehilh is w dift thop to The ple alc ty as d by means f leds tm mat d wth wt 1 Thd inget bens mod

f m tw ty f t forty ght ho rs aft rope nd post In 3 fth 6 cas the opt nd post pet cors was is dindetal in a th cas did th systol blood pes u dopm re the goly 13 mm Hg A insta e of hock

w se u t red The th rs bele th t th m t sd tub ceswepe td by the fa ! ge bl od lo es a d ex ess e t m to t n ft s d by th r pla m tol blod Post p t vyge th py was us d ot elybtrut e postop t b chos py was n temply d

The results thes 6 cales we elas fillows Te pte ts b d c mpl cated re 1 3 tbr was m d 1 g cal d ce f i crea c mp e t de thentalat ligthe d dmafwdys O pt td lped

tapbyl coccus mpy ma a d'r qui ed limited

th racoplasty. Anothe pati nt has tuberculous empy ma and ill our a tho coplasty l ter The fatality occurred as a result of contralateral spr ad in a pati nt with la ge amo tof sputum Amongther51: 1 gpat nts thesput misneg ti e

Of the ra ne ative cases 6 are n gative by cult e methods and 6 by concent to n methods the I tte bei g to rc t to obtain negat ve cul tures The gener lc ditio of the pat nts is good a d some are working

The authors have not attempted to draw any f al c nclusions r ga di g the resecti of lung for p lmo ary t berculosis and th y have pres ted thei results mer ly in the hop f clanfy igm yof the problems e co te ed

FRE TDD RM. MD

JnsRM TtlndPatialPnumntmy in the Treatm at of Pulm a ry Tuber plosis S # 945 4 3 The author reports bis e perience with resection

I the lu g for pulmonary tuberc loss S ce Oc 191 17 p rt al pneumonectom es and 15 t tal p e monectom es have been done. This re po tis up t My 944 The cases are br ken down to gro ps of uppe and middle lobe I bect mies low 1 b lobectom a d total p e m n cto ses Uppe nd middl lob I becto s In this group

th c we e 7 upper nd middle lobe lobectomies. The urg cal ind cat on in 6 of the 7 upper lobe le o s was a persist t cavity in spite f selective p um th ra The othe upper lobe les fib cas us o v th cavity at the ap The m ddl 1 b resectio w s done for b bo t \$15 In th gr p there w s death wh b o about t c ty-o m the later at a b q e t l erlbct myf ate oss dbrn he ta th m ni g 7 pat nts all a cl cally t mi e cept that the r sub; t dt m ddle lob lob ctomy h s pos tive sputum f m 1 at

f th br chial st mp Low Ib lob 1 I this group th re 2 cases f tub reulous bro chi ctasis i f h h as cl ded 1 the g p of uppe lobe l bect m s S I th other cas p se ted th pers t nt caty or postive sp tum f om a llp dl r

The l st cas p s ted a tub l be the ut c ity a l gat esp t m

It as cons de d that the pats t in the last case

old b s fer wth ect on Til ng the o er l b lobect mies th re re d th d the cerdnth f tyth ddy hea tralate al spr d t bere lous mpy m I tal f stul Th th I thwa d t pourat md stint Of th p te ts ll clin cally well th

ptm domeaed gpattm k Tilp mnime Threw 5 cas s 1 th gop In of th m ther w st f th m bochs Tw theasp tedet n ca ous d'ca ern u le ons v l g lu g O case prese ted tube cul h onch ctas

the middle lobe with extensive di ase in the lower a d upp r lobes Th reman g ca revealed a tubercul ma near the hilum with collapse and br n chiectasis d stalt t In this g p only a patient died in the immediate postoperative pod De th was due to a qu to able embolus in the remai ing lun One death occurred about tw y ars after the

of th fo er a d m ddle l bes another a cavity n

op at on becaus of at asson of the d sease in the other lung Another death occu d about five m the postoperat v ly because of c nt alateral dis

se One other patient is in poo condition and expected to de Two of the survive g patients have pos tive sputum in 1 it is due app ently to ulc ra tion of the bronch al stump and in the other to bronch al disease in the other l g One other pa t ent is in good cond ton but h s a persistent em pyema another has nontubere lo s bronch ectasis on the other s de but is fre of tuberculo s There n this group f 5 pneumon ctomies 7 pa t nts have had an xcelle t result and several ar doing part time work

In this whole gr p of resect ons the dividual I gat on techn q e was u ed in all but one case this wa an early c e do e vith the t u niquet Em

pyema de cloped b t the patient survived FORRETD DO RI M D

McCrtney J S Potprti Pulmon rv Em b fi m S g y 945 7 9

P Imonary mbolism is always a complicat on of s m pre e st g d sea e which his almost al yay fined the p rson to bed. When the embol sm t & s place the symptoms usually c m on suddenly De thoce squickly in acco dance with the sze f the emb I sor embol ait some m nut bours or d ys \ot infreq tly the pat nt r covers c m plet ly In br ef the symptoms are dysp ea sub stern Ip m ord omf t cya a danxiety

B to e pulm rv embolism can taken plac th re of a vein in s me part of the must b thromb body The comm np m ry sites f th ombos s re of the l w r ttr mit 's a d pelvis and cly I whe Small no f tal mbol not inf

tly c m fr m th 1ght sid of the heart usu ally f m th atr m Embolism us lly occurs i nd dul hohaesho ne f the d nary gs f thr mhophlbts \nue planed fever or f c cyto is may b th o ly i lication th t some th g is ong Ma si embol usu lly come fr m the l c f mo al ve altho gh th ve y beg n ing f the thrombu m , h ve been far do n the

It rarely h pp that an emb lus has its origin with a ld fop rato I p tients h de l'p thombo th or w th tenbol sm lott ng of the blood goes fa b yond the norm f lim t nd clots form he there has

no b ious inj ry to vess ! M ny factors app rently perat t use thr mbo is U ually the fact is a e d v d d into 3 gr p () sl wi g f th blood at me ( ) my ry i the nd thel m and (3) changes n the composition f the blood

The thoo d ta hs don 5771 aut pses
at th U iv resty of Vin nes ta H sp tals Mn
ap his maded g thetw nty y ars nd g D c m
h 3 1038 Th w 680 (67p e th m
stances of d th tt hutable to pulmo ary embolm Am ng the 2577 cases there we 4 7
po top tw deaths In 6 n tan 53p
cent of th cae th w p lmon ry mbolism
that c uld be called f tal In this goup of post
that daths there were 47 1 sta ces (5 pser

that c uld be called f all In the g oup of post of post of a that shere were et y is a ces ( sper cent) of y now they miss pulm any mbl manalyses of the mt ual a cod to that so op t age and s how d () the times to you can be seen that they have been been seen the seen and they are the seen that they are the they are

d and men) (3) the g a d se m stoeg n d due cond at befo tat m ntat t feq cv fembol m made and (4) th tp h p the age f th pate t t th t me f p t on m y h f as g at mp rt ne th ste f op t n deter m h ther th mb a d mbolism will cr Th M. F Tho T J M D

#### HEART AND PERICARDIUM

In B hem FSP ShrpPn trating H t W und Acts med nd 943 4 496

Aca f st b w und of th heart in h liby ng man of the nyt xy res desce the d At porat a wond & cm l ng was fo d a th perat a wond & cm l ng was fo d a th perat was descent and wind v leet mit risk of u d n th my ca dum n arth h se f th the ght w life the ght vice Th my card um a d p card um wee not ne will be the selection of th

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A REGMO VMD

#### ESOPHAGUS AND MEDIASTINUM

Sw t R H Tra th ci Resecti f th Es ph gu and St m h f Ca cl ma ( S g 945 7

Th technical d antages of th transt ring up to he not well established the span m n gement of ce tan cases of ca conom in the cophagus and of the cade a d f dut; the stomach Start g with the cases for caronem ul g the cade a did not be span us do not span us do not be span us do no

F m the sta dp t f the op t technque t h s d the cases a b ar a g d three grups according to the locat f the g wth Le in th m ddl half f the th cro

to fith esoph gu The eq esoph ge tomy with a h h tath c es phag gaster an t mos e th j t abo j st bl with the h (Fig )

2 Les ns 11g nthel res phag so fundus
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a pot of the sph gus and relt ly la g
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t(Fg)

L s which nv leth m prot fth

st m chht h ch n ad th c d and ofte th

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F m 930 hn th first t th ccgustnect n as p f m d the Mas ach tits Ge t Hoost I B t tl N vemb r 1944 T pt ts thea m f the tomach resophers have h n p ated po by th t nish 6 pp ch

itsee e de dt be priblin mattes we de dit be griblin de pt mint pt many termes we de nicht gith in the pt mint pt mint

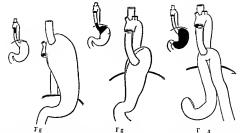


Diagram II t tig th upl tig the perat I n gm t f compl ti e ects ma I th mudth race po te of th esophagu t mach d w hgh th hest th the defination of the control of the f t fth esophagu wh th t m l es thes 43¢ Diagram !! trt th esect I th low sophagus đΙ dus

Amog th entir g pof 7 cases f dical e ect n f llo d hy nastomou 8 p tient died cost pe at ely Tho all po top t ve mort ! ty at the foe was 50 per c t The total n mbe f p ti t who ma ifest d postope ative complications obtain d hy dd ng tog the the num fd the and th mbr fe mplicated ca es d gin ec ve y was 31

43 per cent The total mbe f ec es with to milcation was 41 rop cat

Lmpyema as observ d 8 c s It w a co

t ib t g cau e of d th n 5 f the pat nts b had a total gastreet my In ll f these th r a wide p ad ps s with p rito itis m dasti t rs pt c embolism nd th emp; ma m el; o e a pect fthg lzdfin Me p ted upon b f re th ye r 104 at a tim h If nil mide wa big used locally i the chest a d helore cath t d in ge f th l ft pleural ca ty as us d roticly: Il cases Si ethnih eh ehenn es f mpyema e c pt in th t tal gast ectomy gr up Al dast itis was r cog ed in 4 pat ts d by ut psy m tı It m y have occurred in oth rs wh r do upo h m no ut psy was pe f m d It was u illy ccompa d b the id or f f ct l t iti vas lud tatpy lud tatpy spatent who dd f ve whim gsps aft ttlg tretmy Mayr w d ps occurred a cass Acut pa tit occurred; 3 cases b t all f the patr ts urv d Dust rha ces f hythm with ut oth ca diac

gns w elati ly nfr qu t 4 cases in all In 3

fth st mah The dtals gm t fth tm h s drawn t the hest f low t thracesoph olow t then cesoph ogastn na t mos The nse tah with go thi type I case

F 3 D gr m llust t g th a rang m t f a lt tal g st t my w th trath sph g j j ost my Th ns t h w th g l d a ch cases (to stm ch) (C ty 1 J B Lpp

f thes auric la fibr ll tion cou ed a d d g tali as of hen fit Auricula flutt occur ed in cas and as of 1 rm g se o snes It was finally contr lled by the admini trat n of q inid e C ge tiv fail I the he t was the principal or at le tam jo c t huting ca se of death in 6 pat ents The maj its I these had oth complea t ns as well m tly psis \ diagnos s of myo-ca dial inf ction w made in 3 cases

e pulmo y mbol sm occu d n 4 case

rpeent gan i cid nee of 55 prent In 2 f these udden death resulted In neither cas w th e any videnc for ous thombos s in the lgs
Thomhophleb to l the form l vein requiring bilat r I sup fic al | gation of the f moral curr d in a cases

In the nt re se es of 7 rad cal rese too s followed me fo m I a ast most (thus e cl d g the To kop rations) 8p stope at ed athsocc rr d O the bas f h s e p rience the auth r offers the foll | g summary of the factors which a e c n d ed f pr mary mpo ta ce

A Prelm typepa t nofth patent

r Prol g d p pe ti e hospital z tion f the patie t (fr m o t thee we k) to p ov de f phys cal rest and th rough clin cal a d laborato y t dy to evaluate the pat nt s co d t on

T nslusion ol wh le blo d suffi nt t rest e an smalfe el ol hemogl b n alte ph t hem glob d termu atı n

3 Admin tr ti n f a high pr t in high carbohyd te det. This must often be almost e ti ely

md)

liq id in the obstruct dicases f those p t is ho ca tak sidfoda wellbi cedd t pesc bd 4 Admi t tin of larg d es fasc h (form roo to rooo mgm) p d s 5 \dm istrat lly

f it m B compl i liquid f m 6 Digitals tion in the pat ents ith

cular fibrilat nad in certa in lde ly pat e ts 7 R ti adm st t n f ulfad az n e e ; fou h rs fo fort; e ght hours p di g the day of ope tio

8 Prim nary ju st my fr feeding 1 a f v patie ts ho can ts llw nadequat lq d r semisolid d et

B C duct of the op ation The use of a tratt chal posts epe em

h lation a esth sa (eth d 3gen) 2 Routine e mplete e p n n of the lu g hy the anesthet t eve y t enty to thi ty m tes d the p oress of the oper t n

3 Tansf s of bl d dur g th p That tidesoo athakniennim de a d fr m 2 to 3 pint of blo d e dmin tered d r

A U falk teeh a tho shout Ind gabe anastomos

5 Av da ee f to ng l g masses f t s 6 Scrupulo hem tas a d part cul

avoid the developme t of h m t mas i th m s tery o ll of vice a 7 Av dane of traum t to nes no cl mp n the es ph s n elamp fo the anastomos

utiliz t n of the try

8 A d e of spl n tomy when po bl (t n e ent th de elopment f th ombo i of th pl vein d sub equent hep t emboli) The pl en (b) if adhe e t t th mutbe n ed(a) if t gro tho f the gro th n d's the ti es the ple es el and (c) f t ill lie in th the a ast m (espec ll those cales nah h

s ph ju ostom; pri med o A d c of the l al t liz ti f < lfm d h h would pr d nose to the d 1 pme t f mpv m

oRter tnfcatht frld 3 tm drang fth chest

I Ly tb lft wth tp rust abo b t t th o gh the astomos

C Postp teca Rotn e of th

tent f to tyf r h urs metim s l ag R mo I f th Le in t be o the d v afte

ope t Rm I fch stding th fom f ty ty to has ft ope t deed

ig upon th amount fd 4 C fulcl cal britntice e ch day t d tect p teul ly () t ns on p m th ax (b) fl d n th chest ( ) ev de c of t apulm c d eas (clipe p um ) (d) cad c hyth

5 Aspirati of the chest filled a upe td

6 R is e portable che t r enige gram to fithd so ata s the tm find cated 7 D ly adm tat fintra d med cation f pat t 1th gl cos a md cat d ami og n fp t ni lo a d u ... (acric d ibofla thi mine a d n cota

8 O I feedings beginn gon the filth dy th nc f ter es ry h then a gradual er in the mount a d kind of n trit us fluid late oft old dp dg pon the t lerati (

the pate t The pat to all we d tofbed on the finh t th s v nth day

Sulfad az e 5 gm d ily 15 co t dirfi đу ing if neces ry it is omitt dif gas f to icity ccu

I Belte Isp fi ligate adding of the f mo I em if gas f de p phi b tis de lp after hleth lplm nry mblism idt eted T I ttle time has el ps d s nce the perati u

th may ty of cas t btan any acc t in p s n of h t the end es lts from th ta dpo i of sra al a e to be Thy will nod ubt b duay poi ting fo e e peet t cure thes pate ts H s e th mpo tance f th ope t as method of Pll cannot be t s d too m eh Al gepe cent of the ept ts ca ot sall wen shood h f e ope ti to kep from sta g Th h pp s which e it f m bengablet e tag is truly pathetie may natances. The a L this adopt d the poles f es ting e e y gr with this ca h remo ed if the op atio must be te ceedingly ad cal a h ti eccasa y t rem ap t f the d ph gm the sple the taid the e sore e p ru of the lit b file the taid the pe sore e p ru of the lit b file file fer chradels ug pr h p t nis ret ed fh batruct n deans all w t [c.

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Bea of ther ty im dast ld m dad t tmtustum sth threadd th cas b

dd th I terat e The ympt mat I gy the peut c m a es

plydadaut pyfiding a eprentd The trat m p dtob a ldmas c tsm f all the gml s rs Cheac omt sk

m at found a the t m r s w ll s a s met tat cerv cal lymph de Th t mor ss da fida embry ltyp ftrtm RIBERMD

## MISCELLANEOUS

Hit HV adli reit O Spo ta eo Paed m the ra Pod d by Asc ti J Am 31 1 945 759

It p b hle that t l w ll b com m preval t fter the w ef p rso s of 1 -s 2 1 th t such persons who may have suffered recent ill ness a 1 k ly to consult their physicia before un

dertakın ar travel

It is the opmon of the authors that this re pot of a case of sp taneous pne mothorax in which the precipit ting f ctor was the change of atm phe c pressure produced by the ascent to 8 000 f t in a a splane may influe ce the advice even to patients in this respect

given to patients in it is respect.

In on seleming the mechanism of this acc dent, at a probably easier to consider first the p. c. patata, g. sprobably easier to consider first the p. c. patata, it is probably easier to consider first the patient control to the first patient control to the patient cavity as merely a potent also patient control to patient according to the patient cavity as merely a potent also patient control to the patient cavity as merely a potent also patient cavity as merely as potent also patient cavity as merely as potent as patient cavity as may be an average p. s. r. of about 756 mm of mercury as ma fa. d. In this case the pressur was active about 750 mm of mercury or patient cavity as the p

laps partially. As log as the pleural cav ty re m m d pote tal this would not hat e been possible but with the developm to fif they and roy of the pul monary pleura to separate from the pur etal pleura weakness in the plu a v as e plo ted and pneumo the a occurred.

As f r as the p d posing factors c concerned evide ce seems to point to adhesions or emphysem

tous blebs rathe than to tuberculo s infect on in a large percentage of cases

It has lately be reported that patients with t aumatic pneumothorax may be trasposed by air at low altitudes with utij opardy

Although no definite conclusion may be drawn from the sparticular case this the considered on on of the authors that e treme caut in should be e i ed in adving patents who hive had known deases of the pleura about airplane travel

J NE KI KFATRC MD

## SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Brand n W J M Ingunal H mi th H u th t B in Bullt L t L d 945 68 67

A survey of th publi hed w kon gun fhe n eve is three f d mental f cts th t m st of it 1 the c ns u o un scou cit t that a

the c ns u o un scou est t that a g d deal f t s d ct t d by the f buon of th moment and th t the p est tr t of p og ess th urse w'll cont n t be! pped d fi tely

The cu nt phas n the te tm nt fing 1 n am ght wilbed r bedasthe Oglyn phase Inothr o d smplee c nof the chash c me ta d d meth d f ep r f r the uncompleat d typ of blque h na th Bass n pe t n has be nriegt d to th m r m nd th ereo t t n the bedast to the small smeach of the smeach of the small smeach of the smeach of the small smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small d n the past d the smeach of the small smeach of the smeach of the small smeach of the smeach of the smeach of the small smeach of the smeach o

Visit uth it es agre that bout yope to the cue ces tak ple dug the first twle manhs and that opp ctare fod by the dithe dya Frihe est the figures given fecure encedepado the profile of te gest of the miter dible goof te stat teal vews had capped the just by an

stat teal vews an deapped time ustity an adquate knowledge fithe vriy fith has to top f p t n the technical hits of the rigen vid N estimate fithe currence rate canh any practical vil unless these puts have been m m d m teaffly and he is the vwm t cld nd d is posed to tranham mabres fithe Armed F ce r fith Met

plan Polce freprs which adeq tefr d taryos m de taryo cupt swill tf ys with tad this sees facti sree Foac ng niah maw thg d museds B and n docat high last nifth neck fith sac dec n frith as nith the patih he last cucte F folce getalbe

the Last cut the F fate greather with a mrkedly dit dt fing hit with g dm cul tut the sac subjet dit ohighlig to de niplu ce sitt noefth aft git ts normal iz An eq d Maqueh m thish twid n k adth k d ewill hild be tribbyth of struct fith nagu fear f this gold qui h m am difficant of Shem denso point ni geget d'The modification pir night find man diffication for the second second

everal: t rupted stitches fabs rb blesut er terial Frd ethr a the slk lattee spars be f v d to h th m st us f l Th a tho co tab that th w ks fpost prt recumbence e e tiffet n th tr m t

B JAMEN GOLD M.D.

## GASTROINTESTINAL TRACT

E n n O k Alim nt ry Hypoglycemia af St m ch Operati n nd the I fi ce of G tric Emptying on the Gi T I rance Cury A t m d nd 94 S pp 6 p 4.

In the treduction of the sartied reperty of 1 west gain to respect gehalfs as the gluco tlace curve fter g the terost mysics extens fithe storm h Theer will differ from home firstly by show gahghrintal is it.

c dly hy agent fill fbl dsug th hyp sheeme phase A cas q ce young make hyp give ma often ppe d g the test. If p ted o that form as fith rap blade and g e lic clu sea bd an that que yof cheb ges the bl d cs th mbe of cas vest ated stoon all Noagre m mtp v lia t tb us fhechard on hyved

Of g test p citical to tinth ivitp t sist hq t n who the g st nt t my ad ction c n l adt att k of almentary hypglycem who the dvdul lig dfor d any codt Line this quit

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the pers xam d the blood s grn th byo
glyeme pha fell to 65 pr e to le is jo
of thes cas sympt ms fhypoglyc m ose 6
gth te!

On the has softh wirks refer dit and the au thor's invest gations the limit for the normal maxi n m rise was fi ed at 0 210 per ce t and the dura ion of the hyperglycem at one hund ed and twenty e ception I cas s at one hundred and

fty mn ts The g oup of pate ts with nonoper ted gastric rduodenalulerlkw emp sed soud duals ig d fr m eighteen to seventy fo ye rs th great na) nty h g under fifty years Altogether 52 il co e tolera ce tests w carried out

In tests the fast: g blood sugar w s re pectively d 117 per ce t while in the remaining 50 tly between o 74 and o rio pere tb g thus a co d nce with the value fo nd n th norm 1

s by cts

The great major ty f patients showed a normal blood ugar curve whether the e amin ton was m d during ap od of pa r not In 6 patients with pathol g cal curves o other causat ve factors detected a addit to the ulcer which was fore regaded s b g the ca f th di v g cy I 5 other p t ents 1th p thological curves the pos ibility thet contributory fact is ere nt e uld not be cluded with certa ty

1 8 of the 50 pati nts the blood s ga hypoglyeem c phase f ll t o 65 per e nt 1 ss F r f the 8 had symptoms of hypogly mi du ing the test. O e of the was purp by selected for ex m tion b cause h spoke of ha i g had symp t ms that might gg tatta ks of 1 mentary bypo glyc mia fn the rema ni g 49 ca es the a amnesis conts ed n thi g that seem d t point Th prese ti est g ti s ha e ot been fou dt onfim th ob rvat ons of eal rauthors that leerp t tsm ef qu ntly th rmal sub jets how a sharp f ll f the blood s gar

hypogly cem c phase

The g up of ga tr nt ostomy cases comprised 38 d dual ag d from t venty thee t seventy thr years In I f th se cas s 1 h ch d abetes melltswspeset the blodugershda typ cald abet capp ara c Th spat t not cl ded the f llow g ge ral rv y

I 7 fth rem ng 37 nd duals path 1 g cal hyperglyc mi as beried in alt g ther 32 1 70 tests 1 2 f the 37 cas s 2 m tlr ce tests cr carr dout at i trv l of p to tw ye O of the tet exame dly n the hosp tal n 1932f bery tion b cause f glye ra O thet ccas nasal osbq ntex min t s p th l gical hyp glycem s rved afte th gest f glue This sh that the path I g cal blood sug curv it g stro-te stom my persit as c t nt ph m on m on f may) rs Whe se eral tests ha been mad n the smeidy daith hyp glycm most oft fundt be ith rava blyp thol g cal or r bly n rmal but the re som pt ns t th s rul Otherwe we my fidg t var at in th blood ga e the sam id dulat

dff e te mi at s This applies both t persons

w th normal and t th se vith pathological hype give m a but the variations are regula ly found to be greatest in the latte gro p On the ther h nd w may als find several curves of p ct cally identical from an the s m ndividual

In s veral cases the blood sugar after the ingestion of gl cose n es up t 300 per ee t more The ma imum value is reached at d ff e t times mostly aft fom thrtv t ty minutes b t generally later than in the no mal subject. Mea hile the absolute rise per m ute is greater n the gastr nt ostomy ea s because the maximum value lies h gher In spite of th high ise the duratio of th hype glycem a s m l when compleat ng factors

a n t p esent A great fall of blood sugar in the hypoglycem c phase occurs m e f equently after gastroentero t my than among n rmal individ Is a d pat ents with ulcer The frequincy i the latt tv groups h s been ment d Of 37 pers ns w th gastro e ter st my 7-or nearly half f the numb re am d-showed a f ll to o 65 pe cent or much In (7 of 70 test ) L Lewise i this speet th me ind vidual does n t al vays rea t in the same

manner dur g differ nt tests Fr m v hat has be n stated befo it seen that the bfood sugar curve shows to man char cter tics namely age tad rapid p im ry rise ada s b quent rap d fall to low v lues. The eurve i th efore of the typ which MaeLean des gnate the lag type O the other ha d it must als be emphasized th to ofte find a rmal curve

Glycosu ia was oted in 19 f 37 nd iduals in one or mo e tests Tw of th subjets were se t for e am nation n su p cion of d'ahet s beea e the r physician h d detected s g 1 the u me A third was as al eady mentioned 1 th h spital og for ob ervat und r th diagnosis gly e su

El en of 37 p rsons p ese ted symptoms of hypo glycem a dun g e r more tests (in 5 lt gether) inn of these cases v res; mpt m observed hen thel w t blood s gar valu was ove o 63 pe c nt The g up of ca es f resceted stomach compr sed 95 pers s ged f om ght en tos ve ty two ; ars wh of 8 eremand 4 womn I this goup

13 gl cosetlra cet ts crem de tt mes vars ing fr m ab tt ek t eghten ye rs after th operation The fast ng blood s gar a n mal a d n 3r

f th t tal numb I tests it 1 3 hetween o 77 to per c t h gh al (o 15 per e nt) bing find only i case The maxim m val es vai d between o 119 and

o 294 per e nt P th log cal hyp glye m a was oh rved n 21 of th 95 ca es in altog ther 26 tests E I d g the cas which e mpl cating factors m y with m re or les prohabil ty b p es med t hebe prest thee emied of the aridi vid is 3 (16 tests) n which the p th 1 gical n e must be ascribed to the perat o on the stom ch In normal aubjects max mum al e abov o 180



fl ce fex rt on the blod sugar saldd ths infl ce ad the af esad predispos tion ill to gethe pese tt of ctors which may ceas onally

g erse to a hypogly comic att ck

D fferent op 1 s ha been expressed as to where e a e to lok for the a se of the path log cal bl ds "ar curve after stom ch op ratio s The get drapdrse s assumed by most authors to bed to a r pid mptying of the t m ch The dis orcement concerns especially the question as to why abnormally low values in the hyp glycemic phase I these cases ar I und mo oft n than is usu 1 It is log cal to s ek for the cause in the stomach the f netro s of which are k o n to have Th f been alte d by the operati pres t estig ton att ton h s been directed solely t the stomach. The author hele es that the secr t ry ch nges may he left out f accou t In terest has therefore b en devoted p cially to the m t 1 tv of the stomach

Aft g streent estem and resect in a change in the mecha smof gast ic emptyin it take a place. On x raye minat on the sign rally to add to manifest its liby to rapid empty in A number of w ks are quoted which it is sho n that the re its n find gs in the respect do not all ays correspo d to the man in which a dil t d's lut n

f gluce e is d scharged from the stomach In dr to 1 cidat the possible r lat n b t

th mpty ng t me a d the glucose t I ra c urve lira tonal aspirat on if he stomach w se a dout d r g several tests At ach dete min t on of blood 8 g r some e hic centimeters of the stomach conte t w e aspirated i r a qual tative an lysis for s ga II s p inted out that the method ill not all w 5 furn sha corr tight to the mechanism

I mptying for it m is be assumed that it in my up of twinking start e Ir tomyor ex cited stom the mptying will priced too rap dly imm dit edge the gration of the glosse is the p stop and excess the p stage wil take ploe more all why and the ein this glos to be a lwy and the ein this glos privation of a certain of the tone want has easy to be even a first form of the tone will be some or the tone of the blood by a cruent and the embrying time.

A praion was u dertal, ni ris bealthy h i dun githe tol race tets The stomach was f w d to be empty o e hund d a d th i, five mmutes after i gestion of glo ce at th r st b t n m ny cas swg twas pes nit moneh ndred d the too hund d depty m tes after the beginning f the erp rum ni Nod fi t l to better the cers is this blood s curva d th

gast ic emptying c uld b asce tai d

A p rati n w s 10 pert med n 8 of the s p t ts with p ptic ulcer Th stom h was f u d empty o e h nd d and f e m tes aft the be g annug of the test the earlest b t others e t different times Thus 1 bout one thad of the subjects suga was fou d in the tom choon ints t

th co clus o of the experiment In 2 of the latter ray e min tin e le l pylo t i ln th d case f pyl reste osis ho ever the stomach s found to be empty o e hund ed ni thrity five

s found to be empty or a hund ed ni thirty five mi ut safter the i gestion of glucose

Lake use in the uler patients no certain relation ship bet cent the empty g time a d the blood sugar curve could h n t d. When the gastr c emptyin is retarded because f pyloric sin os is the hyper glyc m a must eca ion liy be expected to last long x th n is normal. In more of the t sis in which the emptying proceeded slo. I was there a great fall of the blood sug m the by poglyc me phase. On the thin hood sugar for the process of mich the hi of sugar for a case in the control of the sugar for a case in the sugar for the process of the sugar for the sum of cation that a pid passage of the stomach contest stends to bring ah ta greater fall of the hlo d sugar in the bypoglyc muchase.

In cases of ga t oenter stomy the rat of passage vered hut twas ing craft more apid than usu! Asp at on w su d taken in a3 tests a d in 36 of to the the stometh was empty in o hundred and twinty minutes or less aft ringest nof the gl coe. The results of asp ratio and fx ray aminatio did not all ays a e. Ne ther were the results of sourat n in the same t dividual leways found to

be c neo dant in the different test

In 4 of 20 t 31s which showed rap d empty (with none hundred and t enty munutes or les) the blood sug r reached pathological values. The sam was seen in only 4 of 15 tests vit shie own passage. To of these tests moreove werem de on the same p tent in whose case a compleating factor (pel 1 gra) was prese t which may be a count d for the pathological in. I the rem in "2 of the 4 tests the hyperglycema was 1 yis hitly path 1 gral In these vest gitness it would see m to he pow d by expe me t that a rapid mpty ag often after the mestion of the same of the s

s need the nawy f the others to allustrate the need from the grows tolerance curved the subject a gestreent rootomy promoted tenty in years carll was put ut of not by und g. The emptying of the stimulation of g. male place; a normal man or the ugh the pylorus \(^1\) vary came nation before the or ration showed rand p sage they gibt heam s

t mosts This fi dig agreed with the res its f sprat n whe by the stomach was (3 pr ment) fund to be mpty see nty fi n nety a d

hu dr d and tw nty mu ute respect by fter the get in of gloo In thes 3 tests m xim m hues of about 0 300 pe c t re so nd but in spt of these high values the d ration of the hype glycemia was normal Aft r the operation 6 t l r act is w carred tail treal of abot cel. In 4 of the ctets the empthy g a fud n aspirat t be much si wer g raith bf th perat n. Ure dy at the first bor access which took pic seve d by ft the pera

t n the blood sugar curve as normal

The easn't rmake s may t to nthe caboth b to nd fite the prate n as that the
previous observation had bown the to n to s
sometimes engreate in the smeal d dual must

and with spite of u form c ndt s f

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b cl ded in the ca
On the bas of these obsers to the nther co
sides that the cause of the patholo call hyper
glycems if it is gest in figices at he find
I have in the gester meyting if the cause lay in
oth fact in (such such as in the part
funt to) the bill od supart curve we him to by

The result of the prations a cases of g stot stymy sho that had e stasomered to hap be twee the emptyon a time a different folloods g nathehypoglyc me phan That the styme styme that the belw o of spart cape cally tests in which the stomer has mpty figure.

at n a ly point of t m Am ag the os individ 1 w thar ct d t ma b 57 were by t d to a 5p rat n 73 te t alt the In 33 of th 57 subject ay e m n t n a m d On comp r th rates f mptys ob rv d hy the two me the dest will be i und that the m t mes c n rda t d met mes not Asp ration carried out the similard vad all diffir t t sts is g esp rtlyd erg nt fid gs Of g at r nterest h ev r the fact th t n mo e th n half f the t ts the mpty g is f und to tal pac m e rap div th n n mal Thus m 43 f the 73 t to the t mach a mpt ed in the urse of n h ndred ad twatv ma tes o z h rter t m aft gl co ge t n Am cted tomach o cal ft nt brects w th as dut tid to case which w pa t cula ly well

ted I I strat the last not are please g and s nt bil of gar In the scattling and test not are placed on the scattling and the scattling and the scattling and the scattling and the scattling the scattling and the scattling the scattling and the sc

oth ry se up te of rap demptying path I ged hyp gly mia not ft n b ry d ft se

t of the t mach afte ga tro t st my Th
ni this is n t q it cle. It spo ble that
th dubl p g in ca of gastr t rotomy—
th is the tom is and through the pyl rus—
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In the hypo ly mi phas h w the findings afte gast t rost my and afte res ction m co c rd nt Aspirat in the escrete cases als h w that rap d mptyin p dispos to gre t

r ti ill blds r fh white pir nume was o binded ad wently mixed less a fall to fig ce to I ss s a observed so fagt t A similar gain cut of the second results of the second results and the second results are second results and the second results and the second results are the second results and the second results and the second results are the second results and the second results and the second results are the second results and results are the second results a

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sh we that the cap larry v os dim lose is the me pers with g te t may r set dist mach no mail not vide als. The he the car the fent be due to the last that Larry was moved f m the blood me est why than g w 1

Theth em the polity fame rapid of the polity fame that the test of the poly of the polity fame that the test of te

of the p esent; t gat s it is as umed that only a lim ted part of th; test al surface part c pates in the bs rpt nu lern rim loo dto s. In case I rapid empty g larg quantities of glucose pass at nee into the it t a d the lut n is dist b t d over a wider su face which is thereby

b ght t fu cto

Arapd mbyis g al pposed t pl n why
persons with a g t te ostomy or resected stom
ach more frequently sho a great fail of bi d s gar
in the hypoglycem c phas than th norm 1 It is
known that the absorpt o of glucose takes pictor
erey rap dly Wh the gastire empty g rapid
the abs pri will be completed m q rekly th n
inormal M a hie them chanism which regulates
the bil of s er after a borption acts somewhat
the bil of s er after a to prion acts somewhat
bring ah t the ractive fall. Wh n the gastire
intest alt act bec m semply somer than is normal
in sugar is present which ca compe sat f r the fall
in blood sugar.

N trig P Römck O nd Svaa Seljesacter O Result of M dical Treatm nt of Gastric and Duodenal Ulc r A t med sc d 943 3 444

During the six and one ball year pe iod for Justary 1 1935 to Jun 30 o 947 patients with gastine od dood at lide co stitut of 10 per cent of all ad ms 10 s to the Drammen Hosp tal in Norway The great mpo tance of 1 extiment in this e dutie as to I for e ident but so far th re bus not been given a lagreeme t sat whether the preferr of 1 estim t a med cal or surge cal. With a year t a sweet given the patient of the surge cal. With a year t a sweet given the state of the state of the surge cal. With a year t a sweet given the state of the state of

At the bosp tal if perat n is not ug thy i di cat d the patie ts a e put to bed a d k pt

can mik diet f freks which is metimes polo gedfort oweks mre Theam uts small at first and it sinc cased grad lly R tg exam to a egte b for and fritratm to nd the grad from the hospitalth ptents ar aded to keep quiet frits we aks a dt ob riva act fuid tl a ne nod of on ker thy e.e.

cat ful d t f a pe nod of on year. Thy e e q ested tor turn at the d of theey ars f ch ical and roentg a re-examination

It was found th t the shorter the bi tory of the

ducase the gr f the pospects for cu to the that at attent in c s wh h the p tents h dh dt th disas follow the first silly me half th m the follow the first silly me half th m the follow the first silly me for the first silly fee from the first silly fee from the first silly fee from the first silly first silly from the first silly first silly from the first silly first silly from the first silly from the first silly first silly from the first silly first silly from the first silly from the first silly first silly from the first silly first

sami ti sh wed th thrice a may i the pa te ts with ligg gastic culc is of those with small ulers co d nd tr the t The digree if del mity of the blo had n gn ticance pog nos s

Th authors conclude that it is very mporta t f
p t is to come fo treatment t as soon as poss hie
if they have had the disease for the first time and
f r le s than f e years due the treatment should be
given In cases of recurrence op ation may be n
dicated but these patients often refuse operation
until another trail of dietethe t estiment has been
made. If the pate t is free of symptoms after a
m derate change in diet ope ation vill g nerally
not be necessary but other factors influencing the
d c soon are the nature of the patient's work and h s
en nomic cond ton

If the patient does not come for treatment until lat operation should be recommended particularly in cases of small gastric ulcers and duodenal ulcers and especially if the patient has not remained of ymptoms aft of letter treatment For large

g the clices in which d eteric freatment gives the best results and the p stive risk i great r operation is not to be recommend do readly although the posbity of cane rices with large gath nuches must be rem mhe ed

Op rati n is to b ecommended m e readily in du d nal ulcer n ccou t of the gre t r r; k of r n wed hemorrhage and the greate poss bility of per f tion Also th m jority of cases of d odenal

leer are in men and as they ork outsid the home it is harder for them t egulate their diet but duo denal ulcer usually occurs at a yong gen hen the ope tive risk is not so great

A ideal tre tm nt is moss bl | I g as the eti logy of the d s ase is u kno n

AUD EV G MO AN M D

Sangully J and Blan o F L Gat le Schwn nom 5 fery 945 7 328

Non p thelial b nign tumors of the stomach are very rar but neu ogen c tumors a e even ar The type of t mor dese ib d by the authors as k own in the m deal lite tue by many ames because of the d file entime e p c aspects v high it may pest and the d fill entitle deser plive opmions explain

g its nature Those on dering if connect ve tsweer og ne il t penneuralfib blastoma others ass ci te twith the rv ust s cand des gnate t as n noom the type de t Schwan scells; called schwan mandlemmom a dsom authors who co sider Schwan as cells as n rogic c il (pe ph ne neu ogl ) te m these t m rs penph c gl m

The there is no tacas of lages of the general tacts of the nogenty from th

d a c nstant feel g of d tent; Her a pet t was good a dthe was opa; The pigast icm s cha ged posit n dwent it was n the ght sod the pt t became to u comf table but he warel ed by d pl c g it especially when sh h d eat n She rar ly vomit db t had lost much wight



Fig. Lat lview ith tm hwihb numm 1

B cause of its o ntg n l g cal l atur s and fe ympt ms the t mo w m tak fra tr gat haar The clinical ympt ms f the c t o c dit s are not uffic ent f a ccurat d g which is aut difficult with the tg cal e am n to B mg t mors of th st mach a donly in large nea can chadag os be up ted Most b on tumors efud t the gretreurvat e tih fu d at the pyl d f the stomach Of all be g tumors th mot as ly dagno d th gast p lyp heca s f t g t cas mptoms a d beca t deg n tesa d When b g gast tumors 1 cated ulce at ar th psloru th y p od a is symptom hich s gg st t the phy a th f rro tg nolog cal vest g to O th thrh d f th b nign t mors sm ll dat dista ce f m th pylorus they mypes at ferng t c \mptoms

In the a thors ca. the ot nol gcale am ton r ald an tragastr less coup mg the ct ca tv A gastric n plasm sem d unlik ly that the hirry call did hit the time he do not not be compared to the the hirry call did hit the time he do not compared to the transfer of the hirry call did his the transfer of the hirry call the hirry call the hirry call pain did by add ther fe fa y sympt ms the feetis m d likel this gastrich arswiterpes t

When th beng tum peduncul ted d w v f mth pylorus a clatively smpl oper t nis all that necessary if the tim is ea th pyl ru p d g st cos r if the e sthesightest po bits of a cer ap t al gast e tomy s r comme ded as a 1 Wh th tum r does nie t d nt the gast ica ty n lipit call c on as made

th ough the gastr c wall a ound the t m a di removed s toto Th pening of the st mach six closed in layers

The gastren plasm was remed to the transatt cally the ghan at to gastre! I pute of ca full him tass; a da other in convalence me ie gast chim there are convalence or in the gast chim there are the rate was no mal jo K. M. M.D.

k pi n H S and Rigi L G Pernici sign miss a d Ca can ma of th St m h-A tops Studie Concerning Th ir I to 1 ti main Am J M S o4 o9 539

Data in the l terature 1 d cate thep bability, pera c ous a cm a and carer oma I thest maching the three courses of the same and cate.

There are not beame and cate.

There a several theores as to the r asons! Le

I a st dy f 23 231 autop n d dala f ty fie year s lage or o 33 cases of pen anem a e e found Thrty f th late I p t d care om f th st m th sucde c of 3 pre at whech m that threates g at 25 th 1 cd ce th rem aut pt f d ad als f th sam age

U eq cally the tat to and cate that the n tological lat ship between personna mas did a cain mass the stomach lot the beam and a blot the beam and the call the lot am ned figure the categories.

en ma of the temach Hazz W Fox MD

Ro C Div ti uliti Indicatio frR cti

S th M J 945 38 65

Th autho h ccently secured the currity on fape to the grup of pet 1 to dom al g sa d gastroeate lo is on the subject of d erituiths The ripl si dat a ded a tea d desp d trend t wardt he made iles on which ill there is escreas a chroichoral effection are not not to be on the control of the c

ec tyrs ha c firm d the wisdom of the d titud n the part of s g ons and the ed gm t f colo th t ha e be en that thems le dem trat d then c styfretripati

Se ly rs ago the auth r ad ocated the

with a d at pool or a dta r dit we of t D c typ it as se colost my because a ppea dt tr am re end be artical auns that it d ble bar id till the very recet; y show r h been de freed a with that it do is with tenoring dependent chatan d d fit test of the tr m is tonpe mably fine t ces the caffe of the log of the transport of the transport of the transport of the log of the transport of tu b g recurr s f their d s ase The inflamma tory react n m y r ppea the tum fa t n may recur and by is lescent into the lo e p lvis pro duce angul tion a d pain r the patient may suffer

f m chronic obstinat o

It is agreed that the motor ment at tions of di vert culosis occur in the sigmoid re ardiess f the e t nt f the preceding d verticulos s This locali

tion is appa ently d to the smaller howel cal ber the presence of firmer fecal masses which ar more lik ly to produce fecaliths in the pock t and the tend new of the bolus t be retained for long per is above the rectos gm d canal For this ason e tirpati n of 1 1 ed segments 1 th area gives p om e f pe ma e t rel ef f om serious compl ca tions

We k w th t bleeding f om the h n I may be p oduc d by both d verticulitis and cz cinoma and that d rt culosis may coexist with mal gna t tu mors The absolute d fferentiation between the two

conditi is not alw as possible

A method of ma geme t which impo sa waiting p riod f from ni e to twel e mo the foll w g the construct on of a c lost my for di criticul t s b fo e e eetio is dec d d upon places an upw ranted b den upon the p tient and leaves the que tion of a

po ible additio al les n unsolved

With all of the inf rmation afford d by procto sc pee aminat roe tgenograms nd lab ratory findings p evious to cel otomy thes geon sh uld he with the added be fit of e moet at to dete me m im me plorat on of the tumo whethe o not s i deated If resection is to he do for d ve tieul ts the co dit on of each pat nt follow ing the col stomy sh uld determ; the l gth of the i terval bef e the les on is remo d

TOS PHE K N RA M D

Rees \ L R gl n l J junitis R po t f n Un u l Case Am J S f 945 67 9

A aspecific i flammatory eo dit ons fith 1 alt act are not ra but it is nus I to see these co dit ons in the pper gast of test I t act with ut a s milar path I g cal eo d t on in the terminal ile m Likewise thes a fl mmat ry c dto ss l dom cause complet a testinal obstruct us No specific infl mmatio s f the gast t tmalt a t occur most f eq e tly 1 the reg on f th terms al il um This dise s d t butes itsell e th ally or diffus ly the ghout the g str nt in l tract When the d flu e type is e c untered th majo p thological ch nges a e us lly l cated nea th distal ilrum It is u sultos the p ml jeju um in ol ed witho te ide ce fas mil rpr e ess m r dist llv

Th author describes n unus I cas of n sp cific reg nal jeju it s n which the p o im l j num w s completely obst uct d t th ce s l ted places Abo t s sect of j num wer ese t d a d n end to-s d ast mosis w s perf rmed Th pati t a reco ery was u e e tf l d she is ell d symp-

tom free one year lat r

The gh this les in is obstructive in nature it sel d m causes as complete an intestinal obstruction as as illustrated by this case Even in the more se cases a narrow chan el can usually be demon

strated 1 ther entg nogram (stri g s gn) The gen eral d nutritional edema present in this case un doubtedly contribut d to the c impleteness of the On exam nat on of the g ss patholog cal pecimen there we found at 1 st thre areas of 1th isolated elo ed segments of sm ll h wel that were greatly diste d d w th fluid and g s These isolated distended loops d d not collapse u t l the constricting eas were incised. The seg a e s with u involved i testine i terveni z is cha acte at e of the segm ntal type of this disease and Bust tes the so-call d sk p areas

Hsually the remnal variety of this diease is not ame able to surgery as the process extends ov such a long segment that resection or s de track or p rations sho ten the gastr ntestinal tract too m ch Because of th completeness of the obstruc tion in the case it we simperative that something be done In view of the two isolated obstructed loops f small bonel resects n seemed to be the only ra

t nal form of therapy

In cases in which the inflammatory process is I muted to the te minal ileum excl s on procedu es re often done but ult mate resect on is usually i dicated In op rating upon patie to with the eon did n one must rem mbe to divide the bowel will abov the i volved port on in o der to avoid recur re e s When a res cti n is pe formed the mesen tery n ed not be res cted deeply as the disease does n t sp ead vi the lymphatics as was once thought The fact that a ye has pass d s no op ration and th are o sig s of r currence m kes the progno appear th y us ally m nifest thems lves with a and p ctically always appear h fore two years

CU RLES BARON M D

Speliberg M A and Gray L W Region I En tritis of th P zim 1 Jej num foll wing Trauma S gery 945 7 343

The case of go nal ent rit's reported he eas f t est ot o ly because of co f m nt of the p th log cal pr cess to the most p oximal port on th jes num but all o because the preceding trauma bad a et ol gical relat o ship to the l A twenty three ye r-old soldier was hospital ed! 1 | ries s stain d when his motorcy cle ran ntoth rea end fatruck Il sprinc pale mplaint was eve e g neralized abdom: I pa n which appa ntly was not er mpl ke He al o usta ed injures thef c with fra tu e of the fa ial hones a d a f act re of the fifth nb Exam at on r vealed n ws hi sign fabd minal wall co tus on a d oe i de fiee a 1 th pert cal cavity Th abd min l pan subs d d within ni e days D ing this pe iod he comit do ly a few times a d c tinned t hav bow I moveme ts nd t pass fl tus

116 Seve

Seven we lis lat the appene cod the first recurrence I bd m nal sympt ms. These we e. I ev d for the most part by a salme cathart e. and enembut residual abdomn I s reness pers sted. The during a thirty-day Is lough he became much wors with vomiting aft r nearly every meal and abd m nal pain.

Physical findings were neder to but issual ratio in the gaster it est it at an thin bayum he ad distant on of the six mach ind disodenum in almost complete arrest of the paque med um it he ke ef of the ligam in of Treits. D tall to this part if about it a cleas the jet journ howed stein six a dabsence of pristallite aves and no cs Imarkines. About three months after jury ploratory! protony re called a less in in this rea resembling the tabulacture in one of the real of all this A short

circuit goperato 1 as done to put the 1 vol ed pott on of the bo 1 atre t and mes aten 1 Jumph node was removed fo bop 3. Afte a go d post perat ve convariencence the patter te food 1 esk b came him ted becaus 1 postpra dul epa ast c not estomy was taken down not the first 1 to 1 ches of the jegundum were resected with a dot on d nastomosis of the emai n segme 1s The was no ve dence 1 st pa as The pathological distribution of the contract of

as was choo e egi nal ent its

The pos ble eti log cal elat o ship of trauma to
regional ente tis s d cus ed

JOHN L LI DOOR I M D

Elm n R nd Red J A Nutriti n i R o ry foll wing R m ral of All but 3 F t i J ju num and Half i the Col n J M M A s 948 4 45 A th tight og a old man had h d mans p evi u

operat ms for regoo allest beginning of right cours of the him executed of the him executed the him executed the him executed the him of the him executed the him

Abdom nal xam, that ead drood tedust in a da fa alfastual x tab w the right; gunal gam na. Cy tos pe monto h d smil gam na. Cy tos pe monto h d smil contracted bladde with set cy it unda na na thou a to epont nal ubtedly d t the abdom he sight in equal to the set of the set

of the pelvi behind the bladde

At the first op at on 3 f t f n email jejo am
e e ob erved to be m g g fr m the l g m t i

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mos as made bet een the 1 1 n ma I the hal thy tr nss es c lo It as deemed in d abl t cie the d ca. ) intest n at th time because of the pres ce f th la ge ext a al menta y absces nth plu The e f e th oper tion as te min telat this po th e te i me se e al loops of d mag d sm il intes tie hahhd been opnddrig the ur i the patio. Thahdml all a closed b th ough and the gh stanles steel placed cl se togeth r Th r co ers from th pers to a un ve tf! nd und btedly as 1 1b chem therapy with both the sulf dugs a d pe e ilin and by complete parenteral al me t t n ith ami o acid glucose el ct lyte a d t m ns and the mt al tr sfu on I I trof whol blood Nine days late the staple ste ! we e removed the pettoneum was ented ditte anastom is located. I the i terral the jum

anation is located I the iteral the ju in he hyp it phe of a tale at it caits p. in The col n was did dit the right the a stone of the first and a da a total et of the right in a did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp, at the did not the spror men tere a terp at the spror men tere at the spror men terminate at the spror me

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Fr biling S Di e cul il of th Ce m A V thod f Van g m nt A S g 945 83

This sacass port of a th ti m I p t nt with a diag is fapp det wh was oper tel on through a McBurney meision O d I ery of th c m the app nd appeared or m I but the lo e m st lat al side i the cecum appeared t co ta a l rgc tumo which as in cised to take a b psy Du 1 g the h opsy the n c s on w s carred do n to a bl ck g ngrenous mass which proved t be a s I tary gangrenous diverticu lum Removal of th gang e us d vert culum a d surround ng tumefaction would have made it m cha ically impo bl to close the cecum The area as therefore it o i ed by se in the pe it e m to th granulomatous wall of the cecum arou d th base of the di e ticulum. The cec stomy has been cl si g gradu lly Jo BG CR MD

C Bngn Surgical L son of tie Right Coln J tm M A 945 7 568

Although ly oe fifth of clime cancirs e found in the ght c lo theil cecale listheloca t n of the m jo ity of those inflammat ry ns d tumors of the bdomen which reques gical tre t ment Tuberculoma simple ile ti and nonspecific gr nuloma of the colon must be considered i th d fferential diag oss fs gic i cond ti s of th

Hypertroph e tub culosis of th t to e re stricted chiefly t the cecum was first described by flenr Hartman of P ris in 1891. It is freque thy pr mary les o The tissue cha g is characte by c ll lar i filtration and e c ive fibros s with sequ t thickening of the w ll and constriction f the 1 men The symptoms re local tenderness a d pan occasio al bi d ng flatul c nd 1 d gest on If the disease nvolves a lim ted area f th

lag be el compl te section dicated Simple ulcer f this ceum was first described ce t y ago by C veilhier I the great may ty f cas s which hav ben report d the ulcer hab in

the mess 1s d of the cecum n r the val e The ca s is unknown the dag ssin no i stanc has m de bef celiotomy o utopsy a d every pat t not operat don has ded Whll stban s cas shave been po ted in the l terature it is p ob ble that num r s unreport d or u rec g ed in tanc s of this dis se ha e occu red The condition is enco ntered both se tvaryi gag nd tvaryigag nd m y first pr ent ts If in an acut f lm nat g phase 1 which rap diperforation is cimmon I the stage the symptoms embl those fa ute appe d tis with pa naus te dimess and lo grade t m p rature The us I pre p rativ d goosis u d thes circumst no his been ppe dotis. Clis ith ulcer the act stage effectul i seco d

gm p f cecal lers is e naft the co dt become chr c-often aft part al p rforat n has ccurred 1 th r ported h o ic ca the pres of t melact on c nst p to ccase al blood a th tool gue disc mf rt in the lower pat of the abd me a da fill g def ct in the cecum teed in an almost mi rs ip pratived agnosis f ca cer. In the cheese is grisect nof the eccum ually neces 13

I egion I leits sa granulom tous prol fe tiv oc fich canfi mmat ry nature which by fer ce b ins t the leocecal valve and ext its un ardal the termin lp t of the sleum dir ct e te s n to the cecum a d ascend ng c lon occu Irequently and this is in part responsible for the suggestion that regional enteritis is a better name Its syndrome is characterized by pa n Ior the les

the right lover quadrant of the abdomen diar rhe fe er ccas o al obstruct ve phenomena and the format on of fistulous tracts to nearby v scera o th abdom nal wall Young men are commonly afflicted In the acute form the bowel is ed and th adh ence to the omentum and adja cent perstoneum and is associated with soft en larg d mese to clymph n d When the cho ic ph's is ched the patient has I st app tite a d reight he has a chr n c 1 complete obstruct n and n t infrequ tly a p loable mass which consists f gray soggy edematous adh rent term al lum nd cecum. The teatment is sur cal and co a sts rad cal moval of the p tion of the bowel in

Objectio ha been raised t differentiat g from

this gra I matous proge ively e tending a d mg ati g diseas n ol i g the bo el wall a rarer g o p of mas ve local zed nonspecific neoplasms hich occ in the col n and in other portions if the bowel Howeve Cohn believe that although the etil g cal age t m v well b the same the gross app arance anatomielocati n andd ssimilar m thod f growth a dexte so warrs to paratec ide a t on Localiz d n pecific gra ulomas of this type while of unkn wn origi a d pr se tin a m cr scop c picture s mewhat resembl g regional enteri ts do not cau e diarrhea str ture and fistulous

tracts they t d to crease in size while remaining at one area the bo el It difficult to s ggest a cle rout d gnost c differe tation between cancer and these inflammatory condit ons because f such commo I ctors as tumef ctio similar ro nte o g aph c appeara ce and chromeity. All of the lat ter bowe e a usually ass c ated vith ome tem peratu elev ton a d with a increased leucocyte count a emi s not p onou ced and the t m r usually mo ese it ve It sperh ps quite f rtunate that surgical tervention is and cated in each of th se c ndit us because if a pati at has r ce ed th exte ded a d adeq te p eparat on n v con s d ed ess nt al in surgery of the l rg bowel b f e th bd m n is nt red any disc epa cy in the p op tive d & sis ca be safely co rect la d the pr p r pr c du e : tituted at the time of s g ry

CHARLES BAR V M D

Pugh II L e f th Coin nd R ctum A spotd Di S Z 945

Ad n mat s s or mult r le polypo d diseas of the colon sa i beritabl c nd to Mal gna t supe w ntt is nevitable tan ily age i pract cally 100 per ce t f su h cases

The first of these tatem ats constitutes a district i d cation for the exami ation f other members of a family of which ne m mher s fou d to be s afficted Th second constitutes a ju t ficat o fo the inst tut n of such a form dable operat e p cedure s total col t my whi h was done 1 of cases here reported

When the p lyp n the rectum and ecto gmod are n t too numerous t perm t the r removal by fulgurat on through a si m ido cope certa nly the operation of ch ic is to perf rm a sid to-s de il st mord stomy as a first stage and s eral weeks later a r sect on of the short circuted I rge bowel as the seco d stag f a two stage operati

was don in the second case The mporta ce f the use of a barrum en ma and

a contrast film foll wig the inject n of ras a d agn stic measure is emphasiz d

JO EPH GASTER M D

Kaufman L R S pl S and M sig H J P forati n f the R cto igmold S g y 945 7 337

Thee cas of trumat c perforate n of the eto gmoud are r ported One perf r t on res lt df m rectal biopsy o ef om a high c lon currigation and the thi d from the admin tration of ne ema I all of th cas s the inte to al walf w n rmal t the te of perforat on so the t the perfor tion was truly a result of trauma

Lapa otomy and clo u of th less n we car d

out in a pat ents on the day of p rio at na di th th rd patient n th day after the perforation. Two of the patients recove ed. In the taica e laparot omy was d o the dy the pe forat on o cu red Att ntion s called t th d nge of perf rati n f om mechan cal ma ip I tion in the el ti ely n

se sit rectum dr ctos gm id vn f m the trauma of an enema The cau s of r ctal my s s it ng in p rio at on s eported in the literat e re li ted Sigm d scopy e en i highly trai ed hands snot with ut dan e I th diff e tald g n sis of the acut abd men on mut co sdrth f ct th t mple n ma re lo ic urig t may cult np rf at on Dlyed dagn ss nd teatm t lt i ge talized septic p to ts wth ts i evitabl highm tal ty

IOHY L LINDQUI M D

# LIVER GALL BLADDER PANCREAS

AND SPLEEN B schn M t n n k f n Content f th S rum n le i n f th Lt nd B t P ge A t m d d 94 77

fudth t nn rm I mds idval the It h s b ion atet fthe miralymetharooy pre t( mgm) Th I lm thas h ng n ar usly sfom 5 t 8 ypret(osto Smgm) The uthest d d 5 pate t with va

ws ncrased t b

n f the le nd ble p ssages a df nd th t mala 8 the rum

of the 6 patients with ac te hepatits (69 pro t) in of 5 patient the h sis f th l er a d o ly 1 of 9 patie is th jaund caused by c cer or h lel th ss These fi d gsagre th th of

previous my t trs which a sh n Reneated d term atto s of s rum ir

with b patit sho edg at idd l rates b tas rule the ma m m w s seen the seco d w kol the ill ess The e was no co sta t rel t ship bet nth variatio sins rum i the ict rus d th lip se alue G phs a g en shown these alues a pate to with hep titis A a rule th act rus a dex a d esp ally the lp val re hed the ma imum quite rapidly and th deer ased at v ryi g rates while the ari t in s rum tro we oft n m re protracted As a rul th lipase val s the first t b c me ormal ta

time when the eterus i de s st ll co sid rably er ased

The ca e of the c ase ns rum on in h patts is n t definitely k ow. It ca not b de to er ased ah orpt on of ron from the digesti e tract Th m st probable th ry seems t b that t d to the Ib att n fr n from th dis t gat n ! cells rich in iro whil at th sam t m the Iv fals to abso b the ron set fr by th phy o I g cal dec mpo tion of h moglob H this theory it's m hadt e plin why the spl n and bo em er wish ldn t et t mpora ly as de po ta e forth ir n n plac of the l'v

The finds gof a ab orm lly high serum to c tent; of value n th differe t I diagnosis fhep t tsh titispo ti emo ly h li to tw th rds of th pati ts thacute hepat ts dth motife qu ntly ly n th first few w eks of th illness Therefore it i i lue only as a pp! mentary m ans fd agn ss An bn rmally high erum n co t nt has at he n fo nd 1 other disea es e pe ci liv p mici s aplast c a d hem lyt c a em s G Mo Amb

W na H S Chillthial In Si Li Cell An rol A 11 1 945

Chof lthis is til q ntly obsert d n pa t nts with ki cli em F cases of schie r d m trated r tg a log cally ar r po ted by the author

Ar ew I the Itrt al arcd f ch lel thu su in a f 44 a t p y ta es f ckl -c ll

a em All pate tsw els th n forty rsof

The occurr c fall rycalcul name bat is less c mmo the loed than th white acc Since the s I e cidence fich I hth asis th n gro schl cll a em gains l t e mpo ta ce as n t log calf ct n the de I pme tof gail to es n the col ed rac

It snthle d that the m sof schl a muaca be pl ds lely o the b sis f b liary cle How it m pos bl that th bd m mal symptoms m fth p tints a d t ch I I thias nd asso rated g ll bl dd r diseas

The rec gnition f siekle-cell an ma as a cause of acute a dehr cabdominal sympt in simporta to derit you'd essayr ope tions. The mere p sence of biliary calculu in a pain at with inche cell a cimiar quis sea of 1 hast on f lied ical symptoms before prat 1 ad ised inc this dis sile s sh risk of surg calpr c durs.

The fore chold thiasis nothering specially is the young egro leaves demands a search for the pence of sickle cell anem a

EARLO LA MER M'D

G and Cipoli E A Study IP imary Can r f th G ll Bl dd (C d es b l ca p mt d la sc l bl ) S m m d B

The lite at eon the subject of p imary cancer of the gall bladder is reue ed a dease h to res and a deu ion a eg ve of 18 ca es seen at the linst tute of Cli is eal Wald ce Bu os Aires for October; 9 pto J by 31 1944. The fee en y of this f mode ce was of freent of all the cases admitted du gits speri dy pe to the cases of beingen day of the subject of the subject

fct t malig a t t mo of th g II bladder was c in II it cas i who the content is fth g II bladd wer e ami ed Amo g the tumors 875 proc tweecac mas a d therst epith homas a d m ed forms 5 per cent of the car i omas a d m ed forms 5 per cent of the car i omas c f th vilous and 75 pec c twer f the i filt attweetyee The sate f the tumo was k a i foopper c toft the cases in 66 per cent it was in th f dus and in an qual numb th body of the fall bild deep the content of the cases in the filter of the cases in 66 per cent it was in the f dus and in an qual numb th body of the fall bild deep.

I so pe cent of the c ses there h abec a p ev us h to y f ben gn disca e in 67 pe c tof th s g p the d ea e was ty cal hepatic c he in per c t dy peptic jumpt ms and in i per c t istent lith s Ther was pain 67 per ce t of the cases obst ct. et s; p n nt tum of th g ll bi dder in 30 p c t and loss of w ght in 80 per

The cli scalpet bidder may be smale the tolers ge sease of the ga and as rul ad finut dignoss is specified unit in the theory of the gas and as rul ad finut dignoss is specified dignoss upper ted in an apatient with minimal to the grade of the control of the co

t ntd g osed tilth each da ad ed t g \m g the 8p t nt iy 6 r op ble a l ad cal perat ne ldb pc f rm d only 2 \s i d gnosi f ca ce f the g ll bladd is

practically impossible tripation of very gall hadd that contain as tones has been recommend d as a prophylactic measure. This shardly justified as the fequency of care in gall blid der diesas (fir mr i aper cent); less than the most earlier measure and even if the gall bladder; removed care erm sy occur; in this timp of the cy tied duct. However, the stamp of the cy tied duct. However, the stamp of the cy tied care tripations with gills its esshould be taken into consideration in die mining the diesations for treatment of the latter diesase.

AUDREY G MO GAN M D

Irwin S T and Mori n J E Congenital Cy t of th C mm n Bile Duet Containing St nes and Und rg | g Cance us Cha ge B t J S g 944 3 319

The authors report the case of a thirty year old male who was p rated upon because of pain in the upper abdomen and r gid ty of the abdomen. The chol cystogram w s normal. Through a grid ron in

cis on the appe d was removed

spp or mit by fifteen months later the pat mt spented up n again because of r curre ce f pain in the right upper abdomi all quadrant and alund c. The gall hladder was somewhat date ded a d th l ver was tense. Ther was a large tumor about the se of a fist in the reg on of the head of the pin cas. This was aspirated a d fou d to contain the contained of the pin cas. This was aspirated a d fou d to contain the contained of the pin cas. This was appraised and globules were during the common of the common during the contained of the property of the common during the contained the containe

Autopy a sperformed a d the cystic and hep to ducts we fould to be normal in size. The comm n duct was didated but a probe cold not be pase ed nt the duode m. Histological examination r vealed a squamous cell care in ma which was be fixed to have o g at d n the common duct.

EAR OLTIME MD

NeglA FntlnalE mlatlnofth Termin l Part of th Bill ry Tract (Eplració fal dlpcó tmlldldtbl) / mtd in est 3 3 37

Aftet a us called to a mistake often made nechol goog apply \ \text{V} it generally cholong oprams show a cl s d infund buildram term nation of the same of et which app n nily will all allot the passage of bile into the duodenum. Ho ever fir quent a d r pe ted e am nations will often show that the iss due me cly to a c nitraction of the sphine ter of Odd and upon rela ation of the sphineter the pass ge of hile is again n timal. No time can be significantly and continued to the continued of the first name of the class of the first name of the class of the cla

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The ca also cases in which the er partial traction buch im lates a tict fithesphict bit his also dispers with emplitirela at in Chilangiogrim ficases illustrating these facts are given

C dtigi n Be gla for the cas ful observation that d cl d these facts which we express for k own August G M ND

Bease C Th Time Fat in th D clopm nt f Complicat n of G lit n s h E gl nd J

M 045 3 338

The autho po ts upon a st t cal st dy und tal with the hop festable in a mo defin t me relatio b tween gullst sa d their squel such as ac te chol eystif sa et pane a tint som mon-duct st es d caret om f the gall bl dder Th completa s and sequelse of h leith has scan a t be ant c p t d f the existe c e of stones in the gill bl dder has not been establ shed Acco do by the time facto f r the dev lopm t of b hary completato s must sl tself to the time lapse h tween the on tof primary symptoms or demonst t no fato e nd the clinical need of the compleations. Gall to see that d to affect app t mat is o e the d f th adult one lat not so the first that the compleations.

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fifty seven plent (o pe cent) pesented to pr
fifty seven plent (o pe cent) pesented to pr
to the seven and the typing may present to as
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Stymept nts (27 per ent) had actecht ystuts nicht gempymgg gendacut feperfrinfthe gall bidde The wenedurt nof symptems nifrmed nnt tyears hih petcally the same tersal a m

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Alth ughth s g neral ment c nemmg th p those e so facute pa cr t tis a significat a and f irly c n tant fi dig is t c at with gallstones. In this s is p t ts (ape nt) had acute pan e t t Thrtt tw p t t (iz pe nt) had st nes in the comm n du t Th a ray

du ati n f sympt ms w s fi e d six te ths y is

Shock A h P th Ch 945 39 9

Lttl ha b n c l l r ga d g the c lt f then ne as follo g death fr 1 l etreal hock The authon m d the b des f 3 men of m lt n ge who died imm d ately f ll w gelectrical sh ck

an earlie of the body and the body are figured of the large who died mind active I law gelectricals het. In each case the pane eas showed for a standard by the mo hage a dhyperma. There n for tree of coagulat n necros s I cales the case occur did the tail the head and body high read in the third case the enter pane was voiled.

Thea th su gests that mino p creaticch may gie mmediate symptom shock trat is It ng ind the hut! ter they my caus p c at ins flicency

E OL my VD

Walk Ii nd Bog W P Ad n m f th I I ts f L nge h n with Hypoglycemi ( 1 Int M 945 75 09

The auth rs r pot 2 cas sof p tents th hypoglycem a wh we e refe d of the sympt ms h rgical rem val of an adenoma of the pa cre Thy state that 56 cases of ces f l rem l f he n ade mas of the lets f La ge hans h

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### MISCELLANEOUS

Benn m nn J Abd min 1 P in in Child J Am H A 915 7 69

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Br em elss fie the mjrity f the series abd minal condit n h ld d comp ned byp int twom cat o es—th de t bstrut n a d th se d e t f ct. Ea h typep esents is w charat t esgs d ymptoms th tv tyo by 1 d gr athe tha

natue f the delyi g co dit
Who the obtruct to a y holl we cu
w tha m scul r pr p ls e m h m thr

te m tte t p m which m y b ery sl ht t e acco din to the d gree d s dd n es

If it is sudden and complete the the obstructio n is agonizing especially at the start a d there m v be sb ck This is kno n as colic no matter what the und lyi g cause There i very I ttle ten d mess. Pre sure is oft n a source of rehef and is

not nfrequently self applied If the obstruct on s pa tial and gradual in onset the p in varies with the deg ee of obstruction It is al vs intermittent it may be almost negl gible yet it may be sever Hyperpe stalsis and dist ntion finally atony if too long continued supervene prox

mal to the point of closure contractio occur d stal to it

I co d tions due to infect on the pain is in re co stant and un form u less the eas c nour ent ob struct on Interm ttent period of gre ter pa n w li then man fest themselv's Ienderness is lways present over the affect d area a d 1 more pronounced th it unelic ted pain

hereas at ophy and

#### CONDITIONS PRODUCING ABDOMINAL PAI IN CHILDRES

Obst et a Amo g the corgenital intest nal oh structions are those die to atressa a distenosis b nds e e trat o fetal per ton t mairotat on of the midgut and meconium ile n which the e is an almot ir movable rubbery mass of mecon um th ougbout the ntests I t act du to a pancreat c deficiency

Piloric si nos s I pylor c st n sis ther is a gradual and part al histruct on There s the cloe only sight pan usually of rogh tom ke the n fant cry Th re is only n obvious d omfort as show by the wrinkl d br the l ok of apprehe d the st pp ng of urs g se ch new p

sode occurs c cd tal with the app ara ce ma imal perist litic gastric va es a d'the app oach

f project le vomit g

Colic The c lic of infa cy in a class by ts lf The pan is ag tz it dfittely it is the tet P essure is grat ful s n the c hies F rs me un e pla ned reaso it t dst occur at b t th same tm ach day usu lly th late ft n n realy e eni The f q cy with which it cours aly drng the first f mo the of life ha led t the term thre months cle Clc as fr que t rm r feq to the bre tred as nother a to cally fed I fat Thed tenti by g fom bum mik may it clib a caus of se c pai nd pos bly f me ch n cal obstru tin lt s ms t u lk ly that acut bstruct my res lt from knk go b nd g n itself of the o rd st nd d test ne in the cramped pace 1 which tl Rlef that oft n emsiom n nm or sp £ fl tu o firm the ca e

to to 1 st alob 1 cts I t ss c pt 1s the most f q ently courr g typ of acut 1 test 1 obstru to It r lati ely ra e after th first ye it the e nd I lm t of I fe nd espec llv no oth re ndit on does them the u ally st te the ex thu at wh h the pa began I th ors I 5 m hours the pas be me less see e a a rule the child does not cry ut as before With each re cur e ce he merely squ rms thr ws himself to one s de doubles up wh mpers moans r s ghs 11 fac s usually becomes s distinctive that it too is of diagnost c value The infant appears calm too calm pay glttle attention to h s surround ngs and yet he seems preoccupied and appreh as ve

The blood in the stool often only in a se ond one brings about renewed interest. The sausage shaped tumor which is pathognomonic in this clinical set ting may be fou d anywhere betwe n the ileocecal val and the rectum it can nearly always be made out by palpat on without an anesthetic if one has patience gentleness and a warm band. Te derness is o ly slight Ar ctal examinat on is al ays reveal ing and may clinch the diagnosis

S dden and complete intesti al obstruction f om any cause such as strangulated hernia volvulus paralytic ileus congenital or acquired bands or Meckel's d verticulum may present much the same pain and other si as and symptoms which occur v th intussuscept on except that the e is no blood coming from the rectum and no sausage shaped tumor

Ch on entest nal obst ct on The pain which oc curs with chronic intest nal batructi n due to con gen tal b ds or na row; g to tumors to postope a tive dhes one and contractions and to other similar cond to s may be negl gible. On the other hand it may be far ly severe according to the nature the rate I dev lopment and the deg ee of obstruction It is Iways at rmittent It occurs with e ch new contracts n of the intestr e The dagn sis must be based on the whole clinical picture

Conge 11 a orectal stretu e Co genit l'anorec tal st ictur is n t a rare cond tion. The obstruction is d e to an i complete fus on of the descending mes nter n and the asce d g p octodeum during f tal l fe with a resulti g in diaphragm or sickle shaped protrus on from the rectal vall into the I me of the intesti e at a point rarely more than a

c numet r above th sph neter ar

D g tald lats n somet mes by one inse tion mo e lten by nsert ng a larg r fi ger each time over a

p rod of days esults in cure

Ob t uct o the thon a test at Renal and wall st ne col c are limo t never acountered in a child Ureth al bstructi n ra ely I ads to much pa ? to sduet Linking vesical eck obstruction le ds to hypertr phy and d latat on of the bladder ur ters and k d eys Children will somet mes perm t th bladder to b come distended to a pa ful degree w thout a yevd ne of eith al cal or ac tral les on A littl neourag m nt a st m admoniti n some runn ng wat r lett n a be ir dden g ri s t up or a boy stand will arly | 3s obviate the neces sity f cathetens ton

lppend is Because an aly a d imm dat al ay mportant and may be v tal ry abd minal pa every stomach ache calls lor the exclus on or establishment of the d agnosis of appendicitis. While the diagnos s based in th mode of o set th characteristic pain t nd mess and vomiting the low fe e nd the usually s min cant le c cytos s is often easy it hy n means always so

The appendix is an in g ficant little organ of serious impo ta ce only becau of t I cat n i the p ritoneal cavity. Whe inflamed it v rv ra ly causes inte se pain or mo than a few d feve As in the adult the p c mmo ly stat n the region of the umb I cus and aft a ar able p riod t shifts to some other part of the hd men usually to the right lover qu dat The t nd mess is always at the point of ma im 1 lem nt nd is of f r greate d agnost c alue the the spont n o s pain Early po t tende ess is the s gle mot important diag ostic s gn R d ty is not an ess t al factor in the diag as of n uncomplicated app nd citis Rehou d'te dernes tere i g but merely a dicates that there san a taabd m at

inf ction Dff ent ld ag s s nd ti uses f bdo p n The pa of a disphragm to plumsy ! right lo lob pneum i may b referr d to th right pper quad a t of the hdom n and mul t the pain fappendic tis The p n is sally great than the tenderness and s to d high r in the ah domen

A heg ning pe itonit's de to perfo tion fan ulcer in Meckel's di erticulum can hardly be differ ent ated from append citis unless it is ac mp nied hy a hemorrhage from the rect m

Torsion of a o arian p del n the ght de gives much the same type of pas and ther symp t ms as those p oduced hy n inflamed ppendix A very high lucocyte cou tor thea ly findin fa small hard fa ly tender mass high nithe ht d on rectal e am at on sho ld mak o the k f twi ted ped ele. The first p emen tru I p f n dolesce t g l e e the i te m strual m tt 1 schmerz of a ruptu ed o a an f ll cle n the ght s de may have to be cons d ed

Mese t nelymph d t so e lled p m ry pe t t as il dry ltubrul ntsm t lobeco d l ١z M D

Ud nd CBadC te MR C trect my nd Decale fication f th Skitt n (C t to may diffica sqit) P £ 1 945 3 3

The gast c ju ce h s b sh n e pe m ntall impo tant f ct i the al o ption f cal c m d ph sphoru i thit st ne It f l that dec l heat on oce din dogs fite em 1 f th stom ch this cold b meded patally bit

n te molet by hy gi i gs luble cale m salts The athers made a ca ful study farp tet wh m gast ctomy had been pe formed t s whith the was true a hum no gs alo This m d ntgen aminato softh 1 mb ac la d plib nes as the ca most f quently th s to of d cal ficat They g t bles sho i g the ch f l calfid gs n the ases d the res its of d t r mn te s of the m ral m tab hsm a d also teng ms of th bo es The f und th bo es

t ben m l oly 2 caes (487 per ce t) whl the wre arm g degrees of d calcufcat 9 pree t The a e of c urse other factors which brig but sehd cale fie t ch 1 uff nt posu etos Ight and thref n ffee tam nt of tam D 1 s ffee t calcum nt k d et a

difett dit olo e dit rh ces didgestie d tu bances i g n al h ch may rm yn t be related to the with tineces t ted by the pe t and othe fact rs 1 d pe dent of the ope at a milgnancy daned g e doc i opathy all of which mye us o i te siv th d calcifcat o

In dec d go a gastreet my all f th se fact rs hold bake tood t and the ldb m mh ed th tit sb tie t p ve td c le fica I po ble r th r th n to ttempt t

AD YGM C MD

## GYNECOLOGY

Pos rs

#### UTERUS

T lind R W The Su gical Treatm at f Prol p e fth Ut u J Am U t 045 127 49

In the gro p f relat ely y u g om suffe ng f m a cond r thi d-degree p olapse vho d not d are m e child n the author finds the Sp ld ng Richardson composite operat of peal val e The t change f this as yet I til k va operation describ d In addit on to gi ng verv satisf ctory pport t aut matically st lizes d thus p e ats fut c delive es from b eaking down the ex tensi e pl stic vork. The author d h tely objects t the Watkins transp t n operation this go p fyugwom n Too may years le ahead in high the tra posed uterus may dev l p ben or malignant dise e and when this occurs the te us

can be m ved o ly w th difficulty

can be myed only with unanaly.

The largest gop f we men who p se t them

le with uterine polapie and vag le lea aton

l so fit they are f ty years of age life ag i

f nly first-degree p ol p spissnithe M hes t r operation serves y ll n the cases in which th uterus i healthy Whe co d r third-degree pr lapse exits d the p ti t s a good operative h he prefers the Spalding R cha don p du e The operate hever is rather pologdoe nd sh uld not be d ne if the physical condition f th pat ent i ch that a e tensive operation o li be ill dvi d I these cases the Watkins n s tion on at a is gu te satisfactory pro i i the uteru i he ithy a d f th pr per size
speci lly sat fa tory hen the cyst cefe is y la ge and the te u n thert large t h 1 t p sed or too smilt 11 self ct v fy the pen ng thrugh h ch th bl dd h s h rn ated The fat that the uterumyh pshl ste frg
future cac 1 sm h t f dsad antag hut hen the cerv x s mp tat d th poss h l ty is ot great the dis d tag m tha c mp sated for by the sh t s of the prat the mn f h mal gthy perat n c ntrandeated. Wh prolapea d ts alled conlt seviet with be ig uterine disc e such as sm ll f broids or fineti lbl d g galhysterectomy i in most th prat nof hi Ho ev the small fb is ar ft tuat d il ab eg f the i tern is e can lite mp t t the corp s q it sati I ctorily and perform a Spald g Rhad prati s with gris In

trap l c d lag the dow tumors I pa t my ty In such ca es ne has ch ce c pt to p f m c mbination f th plast c oper tion and es ary tra abdominal surg ry Wh co d r th rd-d gree desc sus q es

t tm tin 11 ly me wh a not peferrel
rg cal k b t ! lates for v ry l m ted s

Ir m b neath It s the authors pn that chr ic i fl mma tion plays a m e impo ta t part in the pr cess tha the figur s and cat the ghats mecha ism as a

I cal tml is vag e It was n tu common to find 1 lated p tches f metaplast c quam us ep theli m a ompa ied by local r nd cell infilt tin while the ur ning

ar as t e almost ent cly f f both What yer the tiol gy a d sign ficance of th metaplast c epith 1 m it seems to bear no elat o

gery the LeFort colpocless is quit satisf tory if the patient has no f ther int r st n se ual rel t as If the patie td es n t desire to t rmi ate h r rual life a f rly sat stacto rly fu ctioning vagina can be p eserved by perform; a partial c lpocle; i described by Cord Il a d and perincal repair EDWARD L CO

Au bach S H and Pund E R Squ m u Mt plasi f th Cervix Ut rl im J Ob !

945 49 In o drt observe the incid ce of squam metaplas a and find s me et ol gical fact s data

have been re rded on a se jes of in re than 600 e rv ces st ded for th past f ur years The ce ic were fix d sn t to and sectioned se ally ar und the extern los at terval of from 2 to 3 mm

Sq amo s metapli as be di 72 of 100 e rvices n am unts varving from minim 1 ( +) t maximal (4+) the I tter t pr sent ng almost com plete t ansfo mation of the column r epithehum f th I re rvical canal Rac app are t have no effect a the eidence Theyo ngest patient in th se les as t enty one and the olde t fifty one year The e was a nfcatier as a eidence f m th third thr ugh th fifth decades ind the empha z d by a co elatel se in verity f th co dit on The e was n corr lat h t e p ity and the p es nee of m taplast e ep thelium trual d ord rs v r noncont ibuto v Gross ap pravat flac to d evers on 1 as mad on the fresh speeum a ad they r f u d to he ithout ffect as f ctors The e was s ggesti e but si e co elation bet n ch nie inflammati n and the occurrence of m tapl tie epith li m the t we e ol erved togeth in 30 sta ces while mation w thout ractaplasia as seen in 9 cas latte cases cluded ome astances f mo e ac te d ease us ally with ulc ration so th t the mle a 1 obably dip op rti ately high Met pla a w thout uflammation was ob erv din 42 cases 1 e in asive care ma occu ed t ice in the enes In both cas s the was metaplasi in additio to th f k neoplas a but the t op ocesses er at rely di t ct. Th carcer cells treat the metaplast e epi th 1 m with the same d resp ct shown the no mal lumn ep thelium uproot g and di [lacing t t m ligna t d case e cept f r a pos ble common a cestral cell LD ARD L. C FIL W D

## ADNEXAL AND PERIUTERINE CONDITIONS

Gallucci J W liftian tum r (T m lift Rev b t g S P I 944 7

In connects a with the discuss on of t more of the lift an body the mbry ology of the og as wed a disk tehes a given of the topography, while a times a discussion of the topography of while a times a discussion of the topography of the topography of the discussion of the discussion of the topography of the topography of the discussion of the discussion

fround the t m r Bet ee the t mora d the fold fthe larg I gam nt there is a loos is se th t con titutes a pla e of claage which may be ut lied mong the t mo The cysts may his small or thy

move not a much as a 3 rec 4 of ters it q id The inqu dis clear and des ot conta; alb mn muenn r ps udomuen. It contains sm it am unts of alkaine sulfates chi ates and c bonates and som times large am unts of 1 pod when the esita self without per mish for

The etumors my general ame complex tons as ova nan tumors that s fistulials i fee t n ganger ruptu intracyst e hemorrhage and malg ant degerato as well as t so of the ped cle O e ca. i reported in which such a t mo

he nated throght the fight crural ring
These tumors mut bed fiftent t d from t mors
f the ovary collect n of infi mm tory fluid in th
per t e leavity and other; tr lg m ntaryt mors
uch as fib m ct pic pg cy, choriocy the
l m and hydaud cyst Th p ga ssisg ne ally

g od as they ra ely sho mal gn nt d ge e ati g cala dis easy whe th t m T atm nt is ntra abd min I the extirp t n may be accom panid by salpingectomy r due ctomy If t s intral g mentary th bod 1 me t m st b pened and the time on cle tid ling the plan of clevge C m stbetakent p ntrupt th cyst If ptu e cours the muse surfaces f th cyst may be utu dt g the to furtb c cat zatı th muco a lining the cyst may b xti p ted b Lope tech que r the dges f th c st m y b s tu d to th p etal perit n m a d the ca ity t mponed D ing op ato c mplc to s uch as i ries of the bliddr intest es ureters h mo thag may cour Th bl dd is p ll d t of position by the tumor It g ally asy t a old injuring the ntest ness b t t ry easy t inju the ureters T a old uch j ry d ct n shold be doe with the figer than dot be cut.

If minds may be firm the troomra

ves link chace tinn the lite til

be er than birm may miles linch

ces tat sabd malor vigil timpog

These t m rs may be compleated by p eg a h ch it is dac lerates the gowth Thet t ment to b d dur g p gn cv 1 the me as that for t m is f th o ary d g the am pe iod. Among 1 3 t m rs of the ry s at the Gynecological Cl e of the U r rs ty of São Paul di cted by Mo Barre 5 p dt bet m rs f the parova m d 1 a M g g hydat d (3 83 pe cet fthet mrs fthe r) The ge fth pte ts va edf meghteen t thrts lag cases th tm na the ght id ad az n the lift The t mors we n rl grth nth had of af t sat te m 4 ca es they re betw th fold f the mes alpi a dit me i tra I g ment ry prope ly spe ki g 1 3 cas s th tum r s remo dad salp g et my p fo m d f ca e the cyst rupt red h le lp ngeet my I DRE GM CA MD bei g perl im d

## EXTERNAL GENITALIA

Sch uffl r G C and Sch ffl C Current Co pts ( \ ginlii a d \ \ \ ui \ Irritati \ s i f fant and Child en \ \ i \ i J S \ \ t \ 945 53 35

The cases of mitato in the vul ar area in fints and child en e () simplifith a dinglet (2) dap a ha f(s) feet to by het us i clud gin one a trichom and mo l (4) traumation in gestio fold using mattu hat (5) inflammatic ent ing ab t ph moss s d (6) dabet ed mit to Mot infect sof the vol are seed of yt agalis l to of which a tumated 60 t 7 per cent a d to the go oc cus Trainment for the volva interest of the volva in

The gina is us ept bl to ni ctio beca f its rug u cryptiform in rmat 5 a d ts at phe memb e The erv the immat?

female is not a barb r for f t
Bacten logical unfectors f th agrae e lt
fr m duret tra mis on of wt act e i fet e
duckbarge A child s will prafet d fr m d my
hne t lts ats se play r durete tat f fom
midted d lt. The sal ympt m aem kei
redde n r e teh g d thek pruff at
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infected of it. The s'al ympt m ae m ked redde n re teh g d thek prul at typical agan ld charge R ly the is ma tone ad bid of Thed gans is bed po carful hist ty Fby cal minat n sm deby comb nd et al dag le am to bet of ligical m is devit e d a copy Fost cult re my be obta do ly after the restrempts.

Ahgbp tag of hldr drg pota crs Ativet atmentined dhe s f lf drugs p illn t g c s b tace d leaf t sptc applicatos Sulfathiazol a d sulf dazin ac sed in d sages 15gr f rch ldr u de a ven years and in dosages of 7 gr for ch f dren over se nyears giene ery forh rs Ths is to tinued for a period of from seve to ten days when the culture is repeated P nic llin is give in a desag of 200 units prklogram it am cula fy every three hours until from 8 to 12 doses have been gi e although treatment may have t be p long d Estroge c sub tance g v n in the fo m f sup

post 1 s co tam g 200 IU wh h are nsert d nghtly unt I the cultu e is n gat e The authors object ons to this type of therapy are that t is t o exp si e that it requ s too much ma pufation ith bad psycholog cal eff ets a d th t occasionally

bleed g occurs

Persi tent infect n w th pos tive bacter log cal find gs sh uld b made subjet t altern ti mi ed types of treatment Gonorrhea occas nally affects the rectum the a res ltant proct to hich

Do ds ll to azochloramide

I the authors are nee foreign bodies includ ing wood b ans and h iro ns we e comm n cau s of tra matic yag n tis. Diagn sis was e sily made hy r ct vag al e am tio One finger was in s tted nt the ectum a d an applicat sus d in the agina R moval of the foreign b ly s most successfully ecomplish d v th small tooth less forceps under g idanc of a r et l fi g

C TH INE B H

#### MISCELLANEOUS

Ped men J Stud es of Men truation Anomali Fertility a d'Androgen E cr ti n of N mally d Hyp rtrich te W men Al bt Haired 8y c nd 943 1 38

In the e d rin d sea es ; which the ttp. cal hypertrichos s such as C shi g dis se

viril no tumors of the suprarenal corte menstrual anomales and stend ty are fr que t It has been generally a sum d that these an makes are more freque t in hypertr chot c women than in omen with norm I har gro th without a y def te study f the subject

The author has the efore made a rath r cr tical study f the que ton He considers 8 regions f the body that normally have some har and f r

deg ees of ha riness

I CI ss caf normal hair growth 2 Slight harriness w thout hair at the linea alba

3 51 ht hain s ith hair at the linea alba 4 Decided has ness

In th examination of 3 8 f males over thirteen y ars of age he fou d that the greatest number f menstrual anomal s occurred in the hair est indi iduals If also found that subjects with linea alba hair h d more ir quent menstrual nomal es than those the the same degree of harring but with no f nea lba b ir Th re was no difference in fertility in th normally haired women and those with hyper t chosis

Among 64 wom n in whom andr gen excreti n was dete ms d the highest average excret on was found in the very hairy subjects. It was f und also that the slightly hairy with linea alba hair had as high androge e cretion as the very hary. The hyp rir chot c women had on an average of 50 per cent more and og n excretion than the normally Fo the dagn s of hypertr chosis as a sign of

and ogen eff et it is suff cient to find linea alba hair because the finea alba is always hairy with high a drogen e cretion no matter whether the other re found to be h iry or not

E G Moo M D

## OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

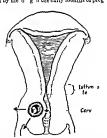
Studdiford W E Cervical P gnancy Am J Obst 948 49 69

The author presents 18 case tepo is on certical pregn ncy from the literatue and a from his or neal rence. It is no probable from the end need to the end need to the the has been permeted that on rare occasions the fet ill zed or um traveries the transcription the seve that of 1 levelopment and having teach of the crivical canal embels it. If m its muco. The dip this or which the penetrate a variable as is the lev lat which it not record not probably complete penetr to not fit them east takes place in the chorton fond sum devel ps in relation to this muc claims. It seems likely that many of these prignance may term late ab to nata eye if y stage becase if the unifavo all in the of ind.

t on and the cf re th 3 escape gant on Cervical p ga nice; a define though a entity Many cases may he c gaized Such per annees areas ly car ed beyond the twentuch week f gestatio. Ut livit an cess ry to interven su gailly help ethe fifth month because of hemo bage rupture of the minotic sac or pe so ation of the cervical wall.

Profuse and viol t hem rin ge accomp e the ttempt to rem v the placenta

Enlargem nt nd expans on of the cerv accompaned by hiedgn nthe early months of pregnancy



Fg Dgr bwgf wksold vum m platd rux Fth d ipm tldt()e f ruxcalm osa by g ndt t th act t ruxcalcanal () ruytr ef inf pra var i teer fth cervicalmuscular deeply aded by ch n n.

i the find g that the c p s ut 1 m t the cerv cal m s should be reg d d s gg t of this condit n

Supra a 1 rupture f the rix h ld be trated b p ompta d rad cal rg ri Intra a 1 rupture f the cervic can m times l tetdim e conservat h hower this npi can mar rquiec calampt too cmpl tehy i ctm

t cont lh mo h g
When pef ration s n t p ese t the pleent
most i ta c ca be c acut d e ther p t ll
o c mplet ly a d ma ually o trume tall th
hem rrh ge can he c troll d by pack g

Rhood to tran fu b ld be 11 ft q q t t t t c mb t the large blood 1 s h ch m s b e pected c sest cated by plc tal emo 1 W th the fl g a d r jeat t suo o t i h e d r th the d l r r d cal op at 1 th t e time t of this c d t t can b h plv d c d Howeter on the a octa hen such a p g nanch p g e es bey nd thei th m the complete be terret my many 1 ll t b f p ocarh

EDRAR L CO LL, M.D.

Barn s J and Brown F J Bloof P the I cd mc flippe tn min N lipp und P us W m nin R it in t the R mot Prog i I th T mi f P g cs J Obi G A E i Emb out S

Many a thors have should be not be to me and lamps: are fillowed by hip ff disase (B was he Dodds ogo Chelly and Somers 1 1917) Of the the had I nhu Ked a dD lill logal a dD kman in the street of the pion the type I man so the two the street of the pion the type I man and the street of the pion the type I man and the pion to the street of the pion the type the transparent for transparent for transparent for the street of the pion the street of th

b en p egnant
Barnes a d Botn in the art cle printh
observat n of 056 patint f wh m 95 r

null pa u a d j parous
Then n lus o s nd cat d th t thee s
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p e sure n nullipa u a d p r m n at
age and that the n mbe i p gan nee ha n
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sue nprus w mn
Pegnancy threfoe do snot casch michy
Pettens n In nprous w me the 1 thloro
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Hypt htents the dbyt m it tents
wh de lpd hypets fllwgt m;
p gua cyw uld haed n so if they had ne r
been pregna t

The authors consider toxemia f pregnancy to b a tempo ary di der closely associ t d with p eg n ncy and leaving of itself no permanent les on There is the effer no justification for term at

g a to emic p gnancy pr maturely i order to p tect the mother from chrome hyp rtension also sinc there is n e idence in this article to indic te that pregnancy p manently aggravates hyperten alre dy e isting when pregn new starts th re

is n justication f r terminat ga early p egnancy 1 a pat ent who h s essenti I hype te sion HARR FIELDS M D

MDW-le GThmsEW nd Al IIA The Rapid Teatment of Early Sypl Ills during Pr g ancy Am J Obst 945

Fo ty three p eg ant pat ts w r treated f r yphilis with mas ive maph isen therapy O death f m ars ical encephalopathy occurred in th group Of th 3 pat ents with early 1 f ctious syphils h c mpl t d tr atm nt and see k pt under obser t m im m f 766 per cent p e s ted go d esults f om the th py If the bab es not p oved to he sphilitic a e elimin ted f m th calculations the probable good esults would be 85

At the prenat 1 syph lis el n e of the Bellevue Ho p tal N v kork thr vere 34 pr g ant patients tr td for arly fetos syphis the t therapy b tw n 936 a d 94 pirt the ade t f massi ars th pv O e de thoccu red f om

cal c ph lop thy 5 p tients de eloped l ce and p tient de eloped e f l at ve derma titi O ly 5 pe cent of the offspr g wer fr

m syph l s

I ther I to ely small some rp rt d her 1 e the apy p o ed s fer and more eff ctiv than ti e t e tment Nevertheless th e emans the k farse cal encephalopathy a dth 15 p b bly g e te with nte e manharsen th py th when th same d g 1 employed tietetm t f

th s d se se

Massi maph en theraps th treatme t f erly fet s vph lis prrt the set of pg nancy have ld decellent relts see thr we lv if a le m g 32 pt ts stat d Th f il occu ed m the who had a cuta eo s r l ps E RD L CO YELL, M D

P M Nelsse i n fnf tion in Pr gn ncy Am J Ob 1 945 49

If fty bette c pat nt hav b n e ammed by sm adelt er th tepa tum trapa t m and postp tum p iods a d p ed t harbor e i e t cultu al identificat F ty four bst tr cpt ts t term in labor w th f di gs sug gesting g h al fect d/o post b t g ti cult es have b n c mpar d with the nei erapostieg pt demo st te certain fa t res lating't diagnosis tr tme t a d m ment of is e ian afect a in pregnancy Cultu e

is more efficient than smear in establ shing a politive diagnosis in n see ian infect on n pregnancy Smear is valuable in conjunction ith cult e in

establishi ga positive diagno 1 1 chronic infections and part cula ly in follo ving up treated patients for cure Repeat d smear and cultu e at the time of a search g phy scal examinat on is the most adequate method of d agnosis One n gat ve smear and culture will not rule out go orrhea

Neisse 1 catarrhalis was is lated from 4 pe cent of the patients In the interest of an accurate diag nosis and f r the protects n f both the nationt and

physician fe mentation studies sho ld be done to identify the particular neisseria present

The gonococc s was apparently activated by the trauma of lah r and was rec vered from the urethra postpa t m 1 2 treated patients who had negat ve cultures belo e labor The g ococc s was reco e ed f m tb ur th a of 8 postpartum patients not pre viously e mined or tre ted. The gonoc cc s was not recovered from the show or lochia of patients proved to harhor the 1 fect n in the ureth

Two patie is with acute go orrhea and 2 with cuted if et as had cally po tpartum morh dity with chinical endometritis

Gono rheal fection app ar d more persistent

and res stant to treatment in p egnancy Diag osis hy smear seemed more confusing in the

preg ant th n in the no pr g ant f male Fo ty fou of the 5 patients ath positive cultu es

we e treated a d 38 we e fo nd to he neg tive after the first course of sulfonam de treatment Sx re mained p it we after the first course and rec i ed subseq ent treatm t EDWARD L CORNELL M D

If asen J L Acut Anterio Pollomy litis du Inc. Pregnancy Acta b t to d 1943

Anter or p I omyelitis rarely cours d n g pr g nancy Th uthor reports what he helieves i the first case observed in the Scandinavi n cou tries The pat t was a woma of tw nty fve who h d usly been well she contracted a te ior p lio pre myel to five weeks b fo e del very her second pregna cy There was fl ccid paralys s of th mus cles of th trem t es the abdomi al muscles a d the ur ary hladder The pr gna cy co t nued or mally As there were no labo par eight hours fter the discha g of the am otic fi id she was give vitamin B and d livery w s terminat d by pr s s on The child was no mal During the first w k of the puerp num there was mark d improvement in th paraly is but afte that its course w s about as us al

This is the twintieth case of a terior poliomy litis during pregnancy reported n th literat re T n of the cases o curr d in the U it d States 6 1 Ger ma y 2 in France and reach 1 C chosl v kin a d Denmark A tabl showing the essential features of the cases 1 given

The dise se may occur at my t me dun g p eg nancy and its course is apt to be more severe than trin h cha band f mesentery usually as octated it the sport mesenteric art ry is stetched as as in f nt of the duode um and causes some degree of compression a d () the vios egydlik ly to be set up by this The pomal duode um tends to b me dist nded a d this in turn can espis as and ainking over the hed which makes the leus more ere. The latter factor is of get impostance in the caust no disymptoms a different heovitom by medical teating the haby will survive even thought by and the content of the medical trip even to give his medical trip.

Vomiti g s us ally the pr d min t symptom ny io m of duod nal obstruct n it's generally f reible occurri g immediately fter e h fe d g nd often the vom tus ; hile tained This last gu sof gre tval e nd aonosis An ext sus ally pro n unced and if the h by is the ced t take me th n it want the tak ss sm ll th t d ste tion nd the onset of om ting may h delayed Const p tion may b seve e but the stool show h vide ce f digesti e upset Wast ga dd hydrato vary n d gree acco d ng to the se e ity f the case Vishle peri tals s of the stomach may be s e hut is of n pyl c t no s Fail e t find th mark d firm pylori tumor san imp rta t p nt in d ff nt at on from the 1 tte co dt n Th g er l e mi at noi th b by shuld nelud as arch fo nfection d cer bral ca s fo th vomit g I rave may show fluid le le in the st m ch

du denum with d st ntion of the latt r
T o illu trat e ca s are d sc bed e pat t
w s treated med cally and surviv d hut th othe
d ed fr m olvul s d sp te t e tme t

J R ERT WILLSON M D

#### MISCELLANEOUS

Har is n C \ and M a ock E C Th \ 1 of th Rh sus T stln Ob t trues J Ob t G B t Emp 945 5 36 The uth rs revi w the statu of the Rh test in

The uth rs revi w the statu of the Rb test in hst tries study g the Rh r cti ns of S el ct d ob t tri al cases

They age in their fidig with the rwoll riss a big dops felalis interns gravis of him byte ma are ocen dliwer that the state of the stat

shross An cess pythr po ess cannot usually be dem natrated. The auth r shave n t found v de ce mt hast dy to ugget the the is any c n ect on b tween the Rh fact r d cep ted abo tons cor n t lah and less in pregnancy at rep ated tillh red and no atal de this the that the dynamist of hemolytic d cess then whom to yananis of hemolytic d cess the n whom o

HARR FIELDS M D

Torpin R Th I if enc f th Pi cental Sit F t 1Present ti n J im M 4 945 7 4

The porte versa series f 500 hims sh w the location of the placenta with its relatinit fit is presentatio. There has died a distriction film

enter e ed direported has pre ous tel Occoptopo tri pres nata my be class ned into 3 categori (a) prim ry occ putopositi pres entit n ccu a tithe o tel of ho that bon t a terop tri nor pre tato (h) occ ptoposit pres tat n thrott the traverse po t n directed of the tato when the traverse po t n directed of the tato dicho po ter ed to the tra-

The etial 3 of these 3 type f pres tat on d ped upon aro fact s Th bo ypl isd fi nithy a cotbt ftr Cald Il 11 loy a d DE pore eld that there as ad tnet i cln tion n the part f the f t lh d to g a te p st d met p rall l to th ud std m eter f thet let I ples thlo a te pot e dam trs ad lati ly aro sd all e a th podpel th e adh t tend cy of the head to on e ther an ceptato r potnrpst Ha 934 d watte t n w m dp lv to th aled by 1 wad p f the ch lsp1 tr s a ca e fpe si t The theatd occpt pote p se tato ept potri ca the p s tajut m jor pel o a ry m llftl o malp ly Th other 6 ll tr t d the n ro midpel 1 ady ds a d Calk s t m testh t the f li n ry bladd 1 may b a \ other fa t co trhut ngí t ri p es tati to h d ht th sthel cat nof th pl ce t

The cident seems to the difference of the content o

drawn.

When the pice ta wall cated a teoly the chafocpt posten pesental fit its was twee egg ts hath pice ta located pote by 33 at 4 spect Wheth plact was the posten raw ill the chaofrepto-

a t nor presentation was early t ice as great as when the plac nta a located ante o ly-co to 336p c nt The inc d ce of ciput ta s rse presentation was 26 5 p cent if the pla ta was located o th p sterio wall a d 33 jer ce t f it was f u d to be on the a t 10

CATHERINE B HESS M D

Hambu g r C Cont ibution to tl 11 mo al D gnos s of llyd tif rm M le and Cloi plihelioma Ba d n 76 Ca es with 11 rm Analyse Act obt gy 1 nd 943 4 45

So n afte the dev I pment f the Asche m Zond k test for pregnancy and I dman s m difica tion of it it was found that p na cy could be brought about w th much sm ller amou ts of ur e f m cases f hydat lom m le and chor ocp thelioma than f om cas of n m l preg na cy This suggested the p s bil ty f ho m I d agn of hydat difo m mole and ho ep the I ma The author invest g ted this quest n on mat al from the Horm n 1 D p rtme t f the Stat S rum Institute f Cop hagen 1 dang 76 cas s f hydat d form m l or cho ep thelioma a d 71 cas s of rmal pregn ney n which no such com pl cat ons w found

II fou d th t qua titat determ to of the ectio f hori cgo adot op 13 of v ry l m t duse ; the dag osis f hydat d form m le as t s imposs hi to establish the upp him t of n rm l 1 s N te en one millon i t mate lu t of dot pin pe I ter f in d finitely pr v s the p ese c of hydat dif rm mol However th gon adotrop excret on has ce tan val e b se i the mat i lexamin d ly abo t o per ce t of th p tients 1th mal p egnancies sho d g adot pn excrton f 300 000 r mor ton lustsperlter wh) 8 perc tof the wth

In u c mpl cated ca of mole th go ad trop to tialls off rapidly and fter a m th s
rally m e tha 3000 it mat lut
hgh crtoni foud ftrthistm it d t sa cmplcat btth horm a alv s d the at fth mpl cati heth t sa m lien t h ri pith l ma mpl m l tem ts th co diti

moles e c eted more th n th am

In the 3 complicated cases of th s mater al there was a protracted go adot opin e cretion shoved at dency to I se rather than to disappear after the first m nth and there was an excret in of 3 000 int mation lunits more a month after re m al of the m ! Periodic determi att ns of gon

dotrop n e c etion should be made f at least six mo the fter rem val of the mole. If microscop c aminat on of the mole cau es su p cion of chorio epith I ma the c ntrol e aminat s should be

made at 1 terval of one or two ve ks AUDREY G MORG N M D

Straus R and De No qu N Effects of n Ab rtil cient Paste ( Utra J 1 ) R po t of a Death f m Its U e and f an Experim ntal Study of Its eff ets on R bbits and Rats A ch Path Chc 945 39 9

The d ath of a you g woman due to an abortifa ce t paste and the medicolegal angle i volved stimulated the e perimental studies described in this art cle

The paste or j l sa whole a dats component ac t v eleme ts v e i troduced in laboratory a imals and mix d with h le human blood and the effects are de ribed principally fr m a histopathological standpoint Whe mi ed ith huma blood th cell I r struc

tu es of the blood h come lumpy a da immediate c lor change is ob erved. The pr pa d co g lum after fixing staining and ct ing histologically prese ted a complet loss of cellular lements b g replaced by am rph us a d g nula masses The 1 toducts n of the m terral int o e h rn of

ap egnant rabbit p od cedd ath within a veek On e ami atto the ute ne cavity was found t he empty and a perforation s fou d at the ste f application of the paste. Section ditissues micro s opically stud dire cal dian extensive nec otizing inflammat y p oces

In an mals hich urvived no ma ked evidence of d mage fo ni The ut i e vall in this jected s tes evealed an e in phic fitr t nof the wall f th horn

The paste h lad fint caustic effect and po d ced ten ep rf rat on and the e ffects had taken pl ce 1 th cas r ported

## GENITOURINARY SURGERY

### ADRENAL KIDNEY AND URETER

Ros ndal T Two Cas s of Sympath cobi st m of th Suprar n 1 Gl nd with Meta tas s t th Cranium a d th Tuhular Bon 1 l d l St kh 94 3 46

S mp th blat mas a t m r made p of m mature cll dev loped i m the suparthet en n to of th sup ar al ma w T or assessare h dece shed i b th of who the t everem tastase t th bones i the shull with hemo bages in the eye ld d i the first case in tastases t the tones i the shull with hemo bages in the eye ld d i the first case in tastases t the tone b salso The pat ents were by a ghiteen and the firm to thooling of a specific part of the salso The pat ents to the crail bones. Both is eterated with rong in a ys. The important the first case is the part of the doubt ever after the beginning of the disase. In the ecind case there was m ld mp ement and the patent was still it es m in this first the teating t b the visual part of the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the salso in the ecind case there was subject to the ecind case the ecind case there was subject to the ecind case t

I the first I there cases the permany tumor to the left superenal glad in the see and case in hoth see no nais and in the cases there we conficted in since the left superenal glad. By the examination of the skell shows characteristic mall spots of him destruction and also no whom with procules

There i more a the control of the co

lly md lte Dff re tat n Dag s gc f m chl ma ca be mad by the blood pr t b t a n f th blood f rmung rg ns b meta ml thtf ta myb gal tapci The abd m ltm may b ryth oblast conf sed th W lm tumo which b w er d n toccu untl ft the se dy a fag changes the sk llm v b conf ed th those f Ha d ch lle Chrita s dis as b t as rule in this disc the elageho difct ad cha ges in the ch lest of cont t I the b! d Th m tastat c ch ges in th b es may res mble th f Ewings com b tth dff tit my be

m d by d monst t g th p m ry t m

Th d a ge ll ends in de th w th f m

two t t m nth W Ir pots ca

th 1 t 11 dt vers fie oe tge teim t 1 th ca.eth sk met tra-ced pper de the id dette po t thera fie irad t of the skull whehf d W sslert to ggest that the my b a system edi as of the yenp th te s ten O fi s che has b nd chid heht he te e perated ni 96 w 11 1931 1941

Pars n C G Tra mati U mia Bril M J 945

Jut theo aldraft (the ath sarted a sompleted the appendant of by Darm dy and he llegs (1944) has lyon the per cast the R A F cas ally continued to the per cast the R A F cas ally continued to the per cast the R A F cas ally continued to the per cast the R A F cas ally continued to the per cast the per c

t ( o18) in the h p th tf rth right m y he h d mecha im resp hie for th a t m 2 f th r cases a he pried B thof the pt is r haithy 3 g. fd ers wh d'e d'eh d a lardam a to c e te s v m scl s tat amputat sh ckw s c d astet! yth traits fill did plamaift as will cot lled by ly gry dith dm hy th tra si istration of p lln a d ull ilm d Uemia dev loped rap dly and we und ubt dly r pon b! forth dath f fthep te ts whs o dw ot suffi nt thems lest c e fat lo to m Frmare e of pre o c e ds t ms prhhl that thr gn ed e mpl s f th condt my ha epa dihr ghth h ptl

cond in my take particular and in particular and in a state of the particular and particular and

catab lism espec ally when co sidered in co june to a vin the apped at which weight is lost by these p t ents. There is no doubt that they all suffer from dehyd aton and or ygend privation due to anemi vas constructio and reduced blood volume—fac t is quoted by Black as increas g its up protein catabol sm. It is the fore p bable that the manu f cture of urea from tissue pote is a biomally repd after severe traumate themor hage

rap d atte severe traumate a chemic may be related by ommon in modern warfare especially the severe domage to a limb involves large blood essels from the severe may be related by the severe the severe from the severe from

Leadhett W.F. and Engst H.C. Th. P. blem of R. n. i Lithi sis in C. n. al. cent P. ti. nt. J. H. I. B. it. pages 32-260.

U 1 B lt 945 53 269 Furte n cases of hematura with renal and teral col e due to the pa sage f calcul or sand courring amo g convalescent patie is: a m litary hosp tal a p rted Ho pit li atto was required be use of 1 ] ri r ounds in 12 of the 4 cas a E ght of the p t ts had bone injuries in ddition to oft t saue wo d In 3 cases amputations h d b n performed With e pt on all p tents were imm bil ed mo r less mpletely for several ecks The tim b tw y ry and ons t of the un ry symptom and b twen eight and one h d I sixty fou d v th av rage b g seventy Blateral cal li w p s t 1 8 cases In ts with unil te l cal l the right d as in dι l din sof 6 cas \ ) xam at o cases discl s i radiop q st es n 3 i stances non fu ct oning k d cy in 5 ea nd hydr ephr ssm a e s s i t a pylgaphy as the most us fld ag ostic pr c d r ln g cas s cystoscopy sperf rmed a dureteral batruetio sd mo t ted 1 all 9 p tients and immediately elie d n Obstruction hich e ld be dignit d by th term cal l e d mo strated in ly 4 f th The obstruct gag at w re s lly l s aggregat ons of erystals am rph s mater af Urin lys s d clos d hematur a and I rg am 2morph cryst ll ealcrum phosph t sedi et In no st c lio md rytl lpt t th u nith ugh s the legificte played itt r 1 art

tl fm t file cal littleser's land little

these substances; the ure when combined with a low take of fluid and a depindent piston of the renal pelves. Attition is called to the adequate admistratio if fluid particulty during the carly period of bid rest and the turning of immobilized or paralyzed of the firequently as prophylactic procedures.

LeDu I C Ur terol Synd mes in the Male J U I B lt 945 53 95

One hundred co secutive cas s in which the day nosis of u teral disease was made f rm the basis for this study. This number occurred in a total cystoscopic material of 3c6 patients and a total ad m s n of 15 46 patients in a m l tary hospital of which the identity location and goog phic nd chimatic envir no are not diselled.

A congental o g not the diseased cond ton of the wreter he echineally determined was probable in 37 instances—m 8 with a history of courses but not i cluded 1 the group of 26 energe the patients. In 50 of the with a p sumably acquired syndrems have not of symptoms by any more supported by the met of 5 symptoms by any with a go orfical in fection 6 dated the raymptoms from an acuter nail fection a 43 dated them for man attack of some contagous dis see Foct of infection were f und less if in than epected only 4 dental 16 tons lia a d

p ostatic infections be d c vered 1 small grop of pat it sattibut d their sympt ms t trauma usu ilya fall or blow on the l r the test cle is hile in a f w cases the sympt m b an aft r a sudden l ft straum.

In an attempt to d fn a cha acterist c sy d ome f r this c dton the hundred patents in the pof yo g soldiers were d v d d 1 to five gr up ccording to their predomi at g compla ts it being understood of cours that this was not a attempt to separate the pat att into different dis e se e tities (si ce clos n lysi wil how a g e t similarity of sympt ms d s gns) but mer ly t Character e a g ral syndr me i om va ous anaches Thus the p edom at ng symptoms 1 of these patie t was renal pa that i back ehe Pain on pressu nd dilatation of the blad ler r u ters on pere so on over k dney 2 s T nty s v p tients compla n dof enure is 16 of app nd citis ( o 1 idity mus le spasm o r bound t'i d mess) the i e a pect I the thell 9 of pyr and 5 of m sc fi neon's ma if stat s Th dag osis of e urse d p nds e se tally cysto copy phass retr ad pyel graphy (15 per cent k odan) a d th r p oduet n f th d st tive phas s p n nl te dern a 1 th d st ti dilatation a for rogolth utrsperhistl t deate sofhyl litsus lie vrin bir malts a dm strable by tl neth ds r e rse n y b lad to the th ry f Sehreiber ga d g if tat ve conditi s f the ntr n c nerves and ga gla of the ureteral wall caus d by diace t if ct c ditions

Tre tement consists in the u e of anti-spass nod es the aradication of lead or feal infect or her narrowing of the u trail lum n is sufficilly nonunced pt nt a iprestint pede uret all dilatation. The pat itshild bed has ged from military a rivee rg v som l hittip of duty

minitary since rgy som I hit up eidulty
From h stud estheauthore ned dest it u eteral
disorders in the mil are in more common than
cataged and shi uld fo su pit ed i amy pit ni
hoc mpl bsofac mbi att infrenal nduret al
pin ni ann jot its if red from so of distu bances
f urmat in part cul ly i quency and u gency
dep ndent up na uh pain as the bladd r fills

Huggin C and Scott W W Cutaneous Uret ostomy iti Central t rai Uret rai Ligati n J U l B it 945 t3 3 5

I HA IL BUF WAY M D

The purpo e of this art ele to p ese t the ment of cutaneo s ur to tomy to those cases I when u tero uter stomy has be neon de ed un se and t p seent reprovements in actual techn q e as w il as in the thereare of the ur trootomy.

The urete ostomy itself a done o one side only the other reter being ted if deut in ca e th'c both u eters are dis ased the b tie i the t used for the uret rostomy. Approach t th ureter is obtained through the lateral m rgin of the sheath of the rectus abdomins mu ele the urete ben bought ut thou h the skin t the I vel of the anterior lige spine. Approximately 18 cm of the ureter re used a d impla t d w th ut tens on or angulat n In all cases an nly ng cath ter u ed to avo dist eture the type fin lly selected being the see F ley balloon c thete No 16F Ih cathete is inserted i to the renal pelvis and the balloon di tended with from 3 to 5 e e I w te Si ht trac t on on the eath ter and the ar pheation of a s gl pece of adhesive tap 1 inch b lo the usels of the u etero torny s sufficient fo leak fr e retent on (F g 1)

There reappended oca h tori sol patint on S of wh m the op r tion he e des b d was pe f rm da a prelud to extirpat on of the bl dder in ombinat in with in some cases extripation of the prost te nd sem nal ves cles In 7 of the 8 th % s do e for som form f canc of the bladd ra dws f cours followed by 1 r d at on The rema ning patie t f th s gr up of 8 m l s had his bi dde r moved becaus it wa f und t be incarcer ted na hue meur al hernia and c ld not h r placed suc c ssfully Th remaning p tent was wom n w th a cervical cancer which had e tended o er onto the bladder In h r ca e the u etero tom was p uulb t oattempt wa m d tor move f rmed the tum r

Am ng these o pati t the wr no operat e d aths Eight of them are al e and co d ton from two to twe ty thr operat on (the average pen d be g over el ven nonths) they have be fire f om cathet to the such as leaks e odo and harness the techost

ureter has given no t ble in these o pate is

1th h in most i sta ces the u e fe m th

1t d u ter was al e dy nf cted

J n W Br N MD

## BLADDER URETHRA AND PENIS

Price P B Experi c with Calcul softh Bid d in N rth China A h S g 945 S 8

Calculus of the bladder endem c n Sh not a province is N rithem Chai Th c i costs in the local lyang stead etarys (trim the pile of n Sh not a gasta very nerved open is the vescal calcul were study d. There only from len the see as and yar ect of the pi into the see a sunday a ce to dit the pi into the best the see and the see a sunday a cut of the pi into the best vescal obstrution as in do only 4 pc. to the path into The average duration is simply in do may be test the see and the time of be spitulation. In the see and the see

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prim by healing of the suprapule ness in The
operative in relity for the entirese e w s fiper
ent No recur cess we e b ry d

WILLIAM W SCOTT M D

Warm n T B nd Mart g E C AN wM thod

Waym n T B nd Mart g E C Ah w M thod
of Tr atm nt of Infiltrating Ca ci ma f the
Bi dd r T J M 1945 4 463

The monty of 1, is below that can erf he bid der can of he red care dby rad at on the fagurant of the red for the six and that the treatment is deated by sate pall amones or to to do he mo hag bad deamers or to to do he mo hag bad on the six of the control of the six of the six of the control of the six of

difficult to determine and imple tation of the nee dles may not be adequ to The bla lder s coll psed t p rm t r d tion of the norm I bl dder mucosa A ne v method of int ttal radiatio f bl dde tumors is d sc bed by the auth is Und r spinal a esthes a a ca cful h ma ual e am natı su d taken to det rmi e the s te of the tumo Previous cystosc | ic vd ce is also at h d If the tumor can b palp t d per r ctum or vaginam a t svagi n l perincal e tra cal approach to the tumor is undertaken If the tumor s above the trig bladd r s app o ched sup apubically b t is not one ed B means of a b lloon 1 the bladder which e n be filled rempt d to ass t in mob high on of the blalder ad q te e p sure of the s te of the tum r s m de possible Whatev r the approach

rad m needles are insert d int the tumor app o i mat ly 1 cm apart a d the strings attach d to the gedl s re led ut of the me son A u eth al cath placed t d n the bladder n s ch a fash on that the bladd ris always partially filed t pr ent ad tion of the normal bladd The oth r tissues a ep tected by vasel gauze p class s ted at the t m of operat on Th d ration of irrad t on is de t rm ed by the size I the tumor a d the number of ll grams f dium u cd The total dose is usu lly

fom 10 t 5 th eshold erythemad s Remo al of the gauze p cks a d dium needl s is acc implished ith ut d ff culty This mith dhas bee used in 6 ca es in with th

vag I di 4 ith th suprap he app oach A at tem t s mad by th uthors to ndicat h t results e bia ed in these 6 cases but th y offer abu da t theor t cal pr of of the eff cacy of the W LLIAM W SCOTT M D meth d

#### GENITAL ORGANS

## D I P n A and D la Pena E Tuh cul si f the P stat B t J U I 944 16 5

The location f the p ostate gland h to en th lo rinary tract the g nital tract and the rectum e pla th frequincy f the 1 | ement of the stat by tuberculos s Tub cul is f the pr t t w thout nvol eme t of ther portee of th g a tour, ry t ct so called p mary tube ulos of th pr tat is atr mely r e It is ge ally gre d that tube culo s I the pr state s al ays co da y t a tuber ulous loc lsewbe e n th b dy The p ostate is commonly ny l d v the blo d st e m and the rethra the latter b ng th c mm estrute Wh nb thep d dymes d the p tat ar ny led tisp obabl that th p ostat s feet dbye t ns nvathe asd fee siom bl dborn tub cul usepd lym t P th log cally tub rc los f the p estat may tak th f rm f m lt pl small tub rel that flag ca tes hich te It rittl wth cal feat f rmati s fth glad cal feat 1 fman I ebl dd D g 18 18 f rmati of t tal ca tv ally h d pon th I callestoy dretalada 3 mı tion

Fight cases of tuberculo is of the prostate gland my f hehthe ewa ac e sti g en Itube losis a e presented In o ly r case was there no s n of urmary tuberculosis This patient had had a pul mo ary and gen tal tub reulosis which had appar ently h aled The prostate gland was compl tely calc f d hen the patient was examined T tal destruction of the p ostat (forebladder) is always the r It of re al tuberculos s Removal f the renal locus usu lly result in the he lin of the pr s tatic pr cess So-called forebladder results in in continence of urine which m y d sappear spontane ously or may require surgical treatment (Lowsley s pen e l plicatio ) liemato enous invasion of the p ostate without a volvement of the ura a v tract may hav a be n cours | though there is lwavs the no sibility of tub reulous men tis as a r sult f sexual excess

Diag sis is dly made by m ns of cysto ureth og ams Treatment of tuberculosis of the prostate should c usist of erad catio of other f ciespecially an i fected kidney-and gener I m sures (the adm nistrat on of calcium vitamins) together ith v cc es a d the i trave ous administration f copper ur a compou ds

DOVALD F McDONALD M D

le m ot n l T ticul Tumo s A & S g 945 5 63

A statistical nalysis of a series of 62 testicular t mors en dur g two y r pe i d i na my h pit lis reported Wher as the inc denc ft ste irt mors is about per e tof all malign nt tu mors occurring in males n c il life the cid nee was 7 p r cent of all mal gnant neoplasms occ rr g in bit enlist d personnel of the United States Army n 191 This appreciably gleat rincid nee is probably related to the age of the personn I a d their p tiep tin 1 athl ties a d sho er baths which retocall tt nt on t cha ges; th scrotal c nt ts and t egul r phys cal ex m ations In 35 of th 62 tumors early treatment might ha e been c as d bly del yed had it not been for the routin I army ! I and the regula phys cal exam nat o s I'r ly 16 tumors as the hist ry of recent or remot t a ma In only 3 cas s was there a h story of imp fect d scent of the testis ne of which was t abdominal The dagnos which was made by the med cal offic r maki g the ong nal exami tion as wong 1 27 of 6 tumors the m st f que t d gnosis wa ep didymitis chitis r pi d dymo-o ch tis Despit thes I co rect d ag ses

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Of the 62 turn rs 1 p dt bhngn Of 51 cas sof malg a tt m ronly 5sh w devil n m to t ses when th p t t was frest h p t l d Tr tme t co s t d of high ligation of th sp mate d foll od by chectomy Pre pe at o

ad to s n t ad isabl becau e h stol gical m nati n of th irrad t d tumor may be unsatis

f ctory Postoperat high voltage vr y the py was employ d in those cases n which th t mor w s fo dit be maligna i Radical e ciso of abdom al lymph n des was n t perfo med Exploratory ope to's when there is a reasonable suspicion of test cula t mor n t rec mmended b cause of

th likel hood of spread g of th tumor

Of th 5 patie ts hav g maligna t test cular tumo s 36 a alive w thout v d nce of metasta 6 are livi g with metastases and in a dead Of thos I ng w thout metastases 16 have b f om t lve to twer ty five m nths foll wing opera t n The l w inc dence of m ta tasis n this series m st be attributed t early diagnos s and t eatm t TILLIAN W SCOTT M D

### MISCELLANEOUS

Hundley J M Jr nd Dichi W K Th Influ n of Gynecologic Di ord rs n th Urin ry St tem JA WA 945 7 57

One of the most impo tant factors 1 the p od tion of urmary tract che ges du to p ssu e e ted by path log cal proc ses si g n the femal plis The thors he given a brif summary I prevous fid ngs on the phy log cal d pathol g ical chan es in the unnary t ct dunn pr gn )

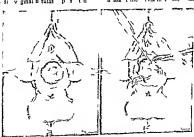
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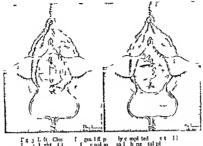
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h ch the surr d ng yaginal mucosa is u d t th d fect Stress incontine ce is of freq e t occurr no It s s in the postme op usal w m a with reg essi e ha ges occurring in the bl ider a d tr gone becau f absence f est g n c st mul t Tgntssfeq tly associt dw th th cha ges a d usually alle t d by th t p cal appl cat of slentrate solt n (f m 2 t 3 per c nt) thro gh the Kelly cyst sc p Stress 1 conti nce s also seen as a res lt f bst tric trauma when the san associated rel at n and st et h g of the f sc al suppo ts The op rat on d Howard A Kelly is of d st not value and tas ee ss is d p de t the p per b ttressing f the vesic l neck Fist las are of nl eq t occurre ce the gre test number res lt gf m op rat e ac d t and f marrad at nof cerv cal cac m les co aginaf fistul s due t childb rth ha e be ra ely seen by the th rs

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b tion per d w s from thee to ten days after se ual e posu The mit al l on was a sm ll r d mac le h h b came papula pu tular and fin lly sulcerat v Mult ple l ons ere ab ut f r time as c mmo as s gle lesions Only 62 of the cases wer in c l d olders Clin cally the les o svere ragged stre ular sl btly adu ated ulc rs co ered with a yell g ay purulent pellicle hich could be world away r valing a n c tie gra ular base which ble leas ly \ redd ned inflammatory ar la w susu llyp se t The ul rs spead by tens n adeal-see dw bs rved to b moculabl and a t in culabl. Ingu. allymphadenopathy was observed in 56 per ce t of the cases Usually the nod s we c frm clast c and movable b t in som cas s they er m tted t ether and fluctuant. The alo after l b rato y tests for syphil's (d L feld) and lymph a 1 ma (Fr 1 k n test) were fo nd gative Cult r s and minunolog cal and diff e tistn tch que e not emplyed for diag DOSIS

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# SURGERY OF THE BONES JOINTS, MUSCLES, TENDONS

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SURGERY OF THE BONES JOINTS MUSCLES TENDONS ETC

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The patients should receive defin to vell guided p eoperats a dp toperats pby cal therapy and ge eral's ppo t ve med cation and nutr to a out d by the m d cal consulta t As th p st pe ative per od goes into the thi d year or mo e there may be a cturn of hip pan h cause of l c l changes in po ition of hony cha ge A good end res It by th's meth d gives a painlessly function hp hich en bles the patient tost wilk a dd es with comf t Th mean a gr at deal to the pati t who pre so s to the perat whas giper tent local hip pain a diwas cinfined to a bed or hill choor compiled to u cerutebes. The McMur pc ation f r the ec nstructi of pai f I nonu ited h p alth ugh apparently mo e ge rally adaptabl than other meth ds of easie e cution a d pr b bly g a gah gh perc t ge ip inle sly function ing h ps sho ld n t he uni creally din such ca.es Now as alw the s rge e p richced in s ch pr cedures ill ch s th one h co iders lest ad pted to the cas in ha d ROBF TP MO TOOM RY M D

# FRACTURES AND DISLOCATIONS

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lwass ca cfully l c lied before operation nd

removed

Suitabl I ngths of fine rubb r t b g (4 mm m) at meter f or subs quent mit listion f pen cli is lution (penicill a tubes) we r t tod ced the global pictors made at least each f m the wound marg as. Usually two t bes we re t trod ced on each aid of the freture. Thy led d want the gion of the hematoma surr und g the fracture without touch g the bear There is leasy a pot intial cavity a out as comminuted fract e or tube at least was place do sith t t wo lid it of the control of the co

The skn was do ed with at trupted 114 mg ut attiches No d p sut es were used. Whe the e was d fixelly un closin a w und the an m was eith to total a flap of skin and f to compl t in sut — 2 very useful man ure — of the gap was for red by m sel to apply an imm date g it the open are a This meth do obtaining a complet clo u was ften employed a d lways c cessful. The authors w sh t mphas c the mp tance of ohta in a complet skn closure at the par peration f ubsequent infect in s to be par peration f ubsequent infect in s to be

av ided
In cases of fracture f the t m ti a dry d ess
ng was coured t the l mb d plast fix to
ng was coured t the l mb d plast fix to
applied in ut e m ner the rubh r tub s po
truding f r3 nches th ugh the plast. The t bes
d d not interfer with m inpulation of the fractuas th plast r wa b ig appl d. When the cat
we set th tubes w scu d to t w tha a tit h
and pen llin solut nustil idd nechoe T by
w reth nake dove a stenleswah d n the sat
y ed by an thr w b a d tb whole fate ed
d m w tha elett to to band e

Aspeats n foll we d by the still fall to fold some per funced through the transmission of tran

Fe cube ce t meters of sod m pencil soil
t (500 ut sperce) n re itod coch the h
echt h ath d fth prat nlycept
tube twee dais fra futher f dys Sicem t
exses hadt the thin the first thin to the first the first thin the

It is e so able t thinh that the i stillat at twif he by i ternals of sol tons of pe cill c tai in soo tsp cube tim t limaintan a hi be local cone trion of penill thinh the prod d by parent rall he rapy differed libermo effect ve in dealin with tiphyloco that psees me differ twe in dealin with tiphyloco that psees me differ to that dealin with tiphyloco that psees me differ to that dealin with tiphyloco that psees me differ to that dealin with tiphyloco that psees me differ to the tiphyloco that psees me differ to the tiphyloco that the tiphyloco that psees me differ to the tiphyloco that the tiphyloco the tiphyloco that the tiphyloco the tiphylo

Pae teral admonstrat of pe cll ca stenlize assular bo fragments a det ra sat d blood a d the factu dur, g th first few days the as the leal t till t n f p cll n suff ce tstr g th and v l m ca doss Whe commend with the us geal the qu described the cast f in stenli re a d eff ct ng pe cast f in stenli re a d eff ct ng p mary n f e mp und f ct uo o d

The presentable for years described in the presentable for pau du frundy good esults myblook diff the direction of the fact rections of the fact rections of the fact rections of the fact rections direction of the fact rection of the fact rections of the fact re

#### Alt n P D d Gramse A E Tra sc dyl Fra tu e f th II m rus T t d by Du l p Traction R pot f 21 Case 1m J S t out 67

The athese port necases fites and lefracter of the home runt at deby the Dodon mit de They tee this the moje ty of case red ctine en he beau ed with for twel e to such a hours

In the caeth td lays reducto is not tred mapulating udrasthesa ad tred no sold The whiter to a stream 3t 6 pound for the fore med from 1 3po ds for the enunterwhith the from fit ct be might ydfr from to to the weeks

M ecntly the ath sha c tudtre t utfalm thim boyu e d f th 1 st ces hehprol gedt et nw sjutnabl

act em t w n tit t d aly
The finf es its a the cases a adt be
xcellent a t f et a de m tcally plas g
May t estig ay t des a pese t d Th

apparat s s lso phot g aphed
SAM E L GOVER LE M D

Burns B H and Y ung R H Comp und Frac tur of th Fem Tr ated with the Aid f P nicillin La ! L d 945 48 36

When a débr deme thaben dine some dis previously the use f pen c llin mak t possible to sew up inf cted a d purulent vo nd and to courage active moveme t not nly w thout da g r t th patient h t w th positi e be fit to the limb

These m thods we occ sonally used before pe clin vas availabl h t now they ca be ed th greate succ ss and safety Fo m rly it as the d ger of sp cading sepsis that was lea d but no with pen cliin e h ve th assur nee th t as so as st ptococci staphyloc cei a d'ana r bie hacill e ter the blood or lymph st cam they a e destroyed A possible reas in fo the lick of enthus asm shown hy s me su geons f r the use of pe cillin fracture of th I mur may b that with the cept on of the i icctions they have to atcd their cas s in the co

tonal man The skn has not ben s tured as arly as noss ble nor h cearly mov m nts be n no aged Certa ly per cllin d s not have s dram te an eff et on I cal seps s t d es pre entio of its spre d but that prev t n sah slt For 1 sta c the e ere n de the no am p tat ns and n pt ccm a in th authors se and t s otew thy that Fu l g nd Clark (944) wh s m nth whol n t to have h ery la or ably imp sacd by the cff ct of penicill n th s iso had no d aths f om s p and n amp ta t sforspssmthirs is of 7 cnp dfc th 70 c streated ith p cilli who c t 1 there 3 daths a d 4 amputat n due t

Ac rly all the p tents had h d me p cli b forcarri I but th doses : trans t v I th del mits b that dos g a d numb r of 1 c s On althy ere immediat ly st t d n afi dycurse of oo u ts g c tram scu la ly every three h urs

M yof thep t tsan dwth tmp tu fab t co F d pulse rate ff m oo t perm ute Th t mper t m t I th m sub

ded a week ft suture S metim s th p cll n mitt d h f e the t mpc t had Th tempe at e was n t thought t h gude frpe ciln smetime nt lith c

d ce of th p t nt prog f pyre a Bett c ld be obta df minp ct n fth I cal loodt sad fth ha h week or so by n t mat n of th h m gl b The suture g wa t determ d bact

cal fi d gs but n a atom 1 g ds ( Ĭŧ w s believed the tonly tript c cc d taphyl oc a ldb lklyt teth blood a dth s w ld there be d tr y d th gh th act f th pe ll The thraf dthtthp cill ti c microbes ha t d cy t g pt ma sp dgp lt pbbl th t th fit mis local a d that thy t lag ly s it phytes If th w d t I th w h

1 que tly doff

As ab as always tak n at th time of the first 1 spectro O ly 1 2 1 unds n the 70 cases w the streptococcu an I staphy lococcus aureus found on culture Many ound h we e harbored the colif rm bac ll s an 1 s me the b llus proteu

b rbored gas o gamsms and z the pseudom nas pyocyanea Th streptococci and staphylococci had been killed by the p nicill and any pus was de to gram negativ orga sms a d was only mildly

n vious Drai age i n t d sirable n these cases It is

p obably hetter to a clude gram egative organisms than by leave g the ound open to allo v acces t st ptococci a d staphylococci which vill grow after cessat on of the pe cillin particularly if a thick layer of gran lation tissue has f rmed a bar i r t systemic pe icill n With a y sort of drai age the e is the possibl ty of two ay t flic, Even pen cll n tubes seem to d more harm than good as a sinus ofte devel ped but as a rule this healed in a ortwo Th s reason t suppose th tit would not

have occurred if the tube had n t been insert d. In stances in which a p nicillin t be as inserted g m posit e c cei reappear d'after the removal f

the tube

With or witho t dra age there as o stance I spre I g sepsis It as n t necessary to op n abscess nay ther p rt of th thigh than the og alwo d in fact ly in a completely a t cases was it n c s ry to copen the wound Th was no cellulitis lymph ng t s

enticemia Loculat n of pus did not oc in ny ca e c m

pletcly s t ed

Suture o n partial suture by bliterating the d d space p v nts a p cket a d e en when the wo disnots t d ow met I th kn no d ceapumping ct of tl q ad 1 cp and the by limit the s c of the pocket by emptying it e ery t me th musele contracts. In no i stane va a posteri c ter i cision necessary 74 S 1t ecess to t hta depende tda ag hy pply

asp ca dt ra g the pat t his face Only 4 I the 48 c mpl t ly tured cas s had a sinus t thr mo the whl o f the 221 c mpletely

clo d cas s prese ted s us s

f th se c mp d fractur s proceeds a q ckly as or eve m q ckly th in closed frac t rs It may be that th hype m caused by the

c ntr lled infectio plays its pa t It is extr mely u d'rable a d also quite u necess ry t mo bone f gme ts unless s

ils h ppe s they a widly displaced Ł I they cast pp d of p rost m th f g m ts bec me evasc larged nd corporated in the bone. It is remarkable h a m xture f mall bo e fragme ts nd p ces f metal grows t g th r t f m ew h lt I 62 cases the erag time fun judg dfom

tle tum I d sca d of all spl t g was th t n ks W ght h ing s ll w l ab ut two ks ter Ing cases ag ftt reif ce a sle d

br dge f bone will b necessary Two cas s ill not

to its who died Po it e blood cultures were obtained property ely an S if the gyr cat small ab blood wa taken 1 glofth Soca ex neormo pos twe blood cultures we e obtained postopera twely. The great it etg. s nof the pathol grait press with one about the bull of the init rail jugular en a d no cases the each lly as power within the bull S ty thir creatents he ome e chils properatively and 32 had one ome rebils por terrait ch.

The tim at which a metastate focu be comes cli really evident is no r I able i deato as to ben th bacte a ere depo ited. Changes the cultar f di were observe do before op ation 21 patient whereas they we noted postoperat by 35 patients. Evaluat no of the material deat de that it as not possible to correlate co sate illy the popt ame of the funit in did begin I coo dit on

pped anc of the funind the general code on it the patent at my gent me Occa mally the hanges in the fundy progress devia after the it was selle ugb to but of bd where the restances of fite umpoement in the fund as in ted despite the fact that the pain it was still

gravely iff

There were 27 deaths in this gr p of 100 un

select d p tents. All pate ts operat d on e e cluded desp te the p ese ce of absce f the bran a d meri its m a numb r of th m on adms. The mo tality f m the thombophichit as much hi he in patents o r thirty j ars f g than in child en a d jou g adults. No te pa

tents wer t at d by operation c mb ed with chem to apy 7 eco e d nd 2 d d Th 1 fluenc of chemotherapy in the t eatment of b teriem a s great and becau e of this one mu t b ware of the tendency to await the ff t of chemotherapy lone in cases n which to I te als us s volv d Unt I substa tal vide ce t th c tra y 1 advanced o e 15 1 st fied in as um n that bact ri ma due t thrombophleh t of th 1 t ral s u will o may pers st d p te chemotheraps that u cal mea ues fo the rad cat on I the phich to proce a arra ted Thet atme tg n erally employed this e seo sted of ohlt a tion of the lateral nus a dl at on f the 1 t m l N AM D FARM AT M D jugul v in

And Il PO Tr mh of the Internal Cr tide Art ry A 1 m d d 943 4 336

The mb is fith interacted it is sea by give doubt if The cale symptom he were rather heaterste not the dagen is can all yields to firm a by art in graphs. The tractic has a give as the the dight of the many in the many and the many Detailed to the many Detailed to the symptom of the many Detailed to th

The bgi sympton generally nature the medea the thombose last ny. The my cory rabeforth bg ng fthe the ymptom. The east ny chesympton has erry to louth rist urist blt line. The

first m Led neurological ymptom sg nerally h mi pa sis m t freque thy i th arm I th begi m g the p res may be I ght a d tra 1 m All f the patients i the ies shed fa al pares and geas the as dit hem nesth a Aph a ge erally beg s ft r th d vel pment f here pares s Amo g th mpt ms that sem t mes pare this a a dp s theht lat ral at emits plpts izus hyper and hype th sı nthe g f the t facial nerve a d tran t vi aldst b nees The p tients are g n rall ? good g neral h lith b f th g s of th art rial les on beg n 1 3 f the 6 cases 1 h ch en ph log aph am at as we emade there as v den g f th lateral ent icle on the same 1 as the arterial I son

It probable that, the may its (c are to also exasses thom be if the all cit act p. The ch f by t fit earm, it p at cebral less by kep gup n ad q t blood sphy to the hra Thee eb lles s probably d t passe of the crebral tr bro the about by the d mag is a tid a try. The fe s f the d m g d s to file artery m to be j d cat d s om cases. The w perf m i of the auther cas be twice to the control of th

A D G No MD

lal J R nd H y H H S g ry f Dep

v us Thrombosi of th Lowe E t mity

S tery 945 7 8

ithep ph i ei Il thromb of o vlps a att mpt 1 m de to im t p p gat n i the thomb t pe t plm n y emblu t creet > l c l c cul tory mp em t Th m thod ft atme t rv ith th type of th m rab nee fplm a ь ad th pe mblm 5 the nlp et calm thou ft t m at in th m j ty f cases lgat I th app pr te 1 ab v th le 1 f the th mbos pe e ces n q8 m 1 % e th uthors prtth sect ces of d p lg t n s me 84 th ombos thel e ttrem t es

The uther sclass by eo them boses result to most phile by when a ted tree must find must ofthe like a dast teth tiphile between the mobbs (implied mobbs). In all off with the despite pages and did not all the todes by the pages and did that with high the despite and longered teaching the mobbs with the despite and longered teaching the mobbs with the despite and longered teaching the mobbs with the mobbs wit

In doe s g th p d poug f ctors the mbox the uther sport the 55 fth case e i m les d sign fem les a datout trye r f g Of th 84 cases i the es fift d gcalf oci les (5 pt. in the abd m 5 th ped p at n pet f b rat m 1 f 1 mba 3 yang the ct my) Tw. to

ca es f d p thrombos which o cu red spo ta

ly in i d vid als jurs g th i d lv o t Twel cales arose carlic patients act he tfilr ven ti prlonged I d rest u of s dati es a d po sibly ligit lizat on may have been important f ctors Twel the pati ts de l ped thrombos s seco dar ly to dis ase or i
ju y f the lower e t m ty (6 cas s f tra ma 3 f
e lluhtis 2 of gangrene a d r of a thrit s) I h thors also h d 8 cases in p t nts vith p lmonary t b culosis how navegime fatrict bed t a ds patie ts ll vith p umonia The chief f c to in all these ca es app red to b polong ILd

st e cepting the predi posi g fa t rs such as

b ty man fect o and neoplasm 1 of of the 84 ca e th first symptom as pain 6 tra pulmonayembls and in 7 it a swell gof the calf The mote mm nsg ase if t de es heh sfund in 78 f8 ptict vami ed frit 11 mans sign wa positi e 68 a es Thr we e ly 6 cases wh hth tet s gat e 1 vc nd t chyca da s e they fe au thy coll be accontelf by the p mary d s ween thry helpful diag ostie gs to g am ere mad 27 of the 84 ca es and e e t e mme led t ly becaus of the d fleulty terp et ti f th rmals Th auth rs belie e

f alu that the ve g m th dagness of i ubtful case In 16 of the 84 c - Julm a 5 cml 1 sm a th

tal symitm lin 3 add t al cas spul m ary emilim ce reibí s g callg t Th auth r n t d n i crease i the mbe fi l m are ml li th ince i g ge Thev L lie th t pulmona y embol m is a pote tial dang n ry ea c of eno thrombo ; ard that the period in any f the ea es i th first f u month of the d ea e They also stat that th 1 al picture of case i un labl for det mn g th

lkihood of | lm na ) mbolus Oft th th m bu in the ili e i not fixed t the t ma a d epeated p lm s embol m comm ca es ometim fo d vs or e ks

Plm n yembol moccurr gaft rlg t may en may ignat from ral surce th most fr q e t f which a thromb ss th v of th other at mity It al o may r ginate fr m a th ombu in the lighted can be eth lefth light f mother es i the body of form thromb n the ight de f the heat In of the &4 caes th pat tshdplm ry mbli fte Ig to of one or m re er bt n ry case th e had been one m re 11 odes of pulm ary mh hmbfrelg to I 51 t cestb mbol ar f m the pposte u operated e t emity and in 4 ca es fr m f esh th ombus abo e the por t ol lig

tn Thr ftheplmnry mbolldt Itl utcome cre 98 con cuts pe ton on thes 84 c es (35 e o the ght leg lo 33 o th left a l 6 n both lgs) Ul lgat ns wh h wer d befr ope g f th e f i pect n wer mad abo a licl w the pen g th v w | ll m i

f th f m 1 Th gher and d g 29 on the la cins a d 6 o th inf ri r vena ca a Th the re call atte to n to the fact that e fifth of ther tie ts had venou th mb sis in both e temires

The r le t be follo linlg tin is ligate the affect d vein h th le el of the thomb s n a normal segment ju t distal to a mai tributory and as dablid dirwhich a thrombus may f

The e geat d gr f a ecu rent thr mbos s when lig t performed th ugh a diseased seg m t la et e e though the clot may have bee remo ed r ma not ha e extended to this level of the vem

The mbeet my can be don without danger provided the cl t s fr sh and unatt ched to the intim and the vein Il s fr of nflammat o If the cl t is ld thromb ctomy a too d age o s becaus of the I kel h od f d sl dgi g fragme ts of the cl t

In cases f p lmo y emb lism fr m ve us thrombose even the hot cle ly ll patient i a can did teff ven I gat o N e of the pati ts d d from the ope tion If on peni g a vein the inflam matory proces seems to extend b yo d that p nt th 1 c 1 n sh ld he closed a d the vein ligated higher Th te nal ili e vein was ligated nly 6 times s c the problem of th c ll te al ci cul tion makes ligation less des rabl h e All operations o the lac e do e by the e t aper to cal rout a l n almo t e y case adequate xposu e fo e pl t n f the em b fore ig t n was obta d The a th rs e 1 agre ment with the idea th t bil teral inject n sh ld be performed more f e q ently

In 45 cases in 1 h ch the e was no preceding pul monary embol sm p 10 to l gat o one dev loped fter operat n Since the cha ces of develop gan embolu ar b ut ne in thr c; the type of throm b s su derd cu ion th s v s ign ficant ach v me t Of 39 p tients ith preligat n embol m 9 had emb l m fter l gati n I 8 f thes cases it ma th res lt f adequate s gical tr tm nt rath r tha the fault f the pr ciple f the tr at

ment The atheral ohacth mpess athat ftr ligation the e i 1 s tend ney of the thrombus to e tend bl w the lvl flgat n a d th refor the p tent se s chan el are left a allable f th coll teral e re l ti Pat nts who ha e had th

common il ac inf rior vena ca a ligated u ually d I p a mor complete c llat ral circulat in than hom the 'tternal il ac o femoral ve 1

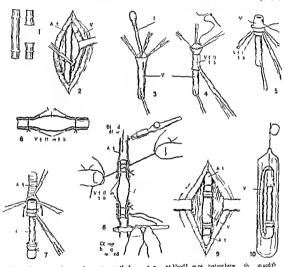
l gat d

The fu cti nal receivery of the tem ty after I g tion 1 cell t The pa 1 qu ckly r leved nd vasospasm s u lly ab I sh d p omptly The d ma wh ch s m t mes t mpora ily 1 cr l after l ga t nu maile s b es after a f w das of et nd le tion fth xt em to Thew r gofan last c tock gwhen et it) is resum di ad ised at least tl dema l ngerd el psasa es lt facti ty Ro TR. Bi to M.D.

Blakemore A H and Lo d J W J ANon ture If thod of Blood Vessel Anast mos a E pe I mental and Clinical Study J im M ( 7 685 748

Blakemo e and Lord descr be a onsut method t blood vess I an t mos employ ng v tallnum cuffs This method cons sts in threads a vein graft through one or two cuffs and everting the ads of the tens gment er the cull a such a mann r that the se red end I the arters may be slipped ov rithe ted vein 1 tima (F) 2)

The method affords a br ad te n ntima to art re intim to tact to heali The hold ng I gature s rella ayf mth fo in blod In the presence of bacter af contamination this type of junction wo ld seem to off an ad a tage o r the sut eyu t n



m thod Cann la and t bes (f bl t be tech in sing! note that in branch is Rm alf (supia n w th fin clamp g 3 Intt m sol to of sodium chlog ft th allam tihpn mybe deed if nd t whi h des ed 4 Method fitn gul tange d f ena with m = to amps Cuffing rd securing erted d f in the setall um t be 6 D ubl t be techniq that

g ftmuted 7 I todum the distal d fth gritmou ed na italiamth t the panal end fith art ry 8 Tyung fin salk hgat eng tsn g

nt bloodf mpe trating betw et ry tumas Also leasing th p um i rubbe shed lamp first t i cultat the p ssage d talward I my esad alamb bbles thin th graft o Crm ted anastomogly ou dt. natsis thepe ascula tis. es losed t mused stry he pos hi A twy for server here teally lide disays tell be grafted a chieferang. The graft most ned this to twy fpe n sol tra I sodrum hi nd dm unted the the ed is passed through th usual m seco dt be ad b ught o t the first t bet p tect th tions til used. Aw serves t uspe d the graft

s in the latt r th seel wall whi h s enc mpassed n the sutur lin a dis some hat stra gul ted les di ct co tact th the fl wing bloo i The joint

is leak pr of 1 the presenc of antic agul at ther apy flow v r o the other h d because of blood to intima co tact nly th a astom saffo d I tile or no stimulus t th ombus i it ation when the blo d

clott ng tune is n rmal

The method was pree d d by successful mal aperimentati when it as shown that a 90 pe cent pecta ce of success in bridging d fects of the sm ll f moral arters s of dogs w thout th use

fatco gulants 1 possibl
As in the Carrel uture t chique the ferform ance of debridement a d the use f sulf amides g atly b ost the perc ntage of ucc ssf l end results II we r delay ganastom s s in co tam ated wou d second ry hemorrh ge occurred only one f llow g the nonsuture tech que and this a a t ty fo r hour wo nd a which no sui fon m de was us d in aneury m either at the rtery vein ju ction or in the vein graft has neve

hee observed the no suture an stom ss
T gain information a t whether h t plastic
vei s will fu et n adeq ately to prevent ga grene
when used to hir ige arten 1 d feets the right h d leg of two dog was amput t d at the midth gh level After an int rval of twenty f ur hours the legs w te reimpla ted the non uture two tube tech q e as used a dve grafts i om a third and fourth an mal were employed to bridge the 1 fects in the fem ral artery and in The amput t d 1 mbs were p served in cracked e dur n the tw nty f ut hour interval. The dogs were gi en sulf th agole (1 gm twee daily by mouth) from the time of the first op rat n

Th surv val of the l gs in these 2 dogs depended solely n the function of v in segme to transpl nted from ther dogs nd in this se se the exp rime to re critical Heteropi town grafts to bidg f mo al artery d feet in add t nal dogs have used The tom s s fu ct ned for tw ty days (ave g) which swift byon th ps

tulated fourt n d y f post traumatie edema
The p rv t i in grafts has be n i u d deq at b the segme ts of veins e q ckly fro n in an alcoh f sol dified ca bon d de mix ture and k pt in the fro n stat Th se fro en grafts f cti dq t ly h u d as betero pl st c g aft t b dg art f d f cts and witho t the use fat coagulats \s gment of h man saphenous \in uselt bridge d fect th d g s a ta ask ptf t nty for hors the c box and th quekf n ndp rv dfr three week it w used \ ns may be kept f n p pare tly f r 1 l fi te periods Rp td dm strat h s caled that

wth r dym u t d em grafts at b nd compl t f a tm may b o t fy compf shed wth n fifte n m ut s by the a rg prat r I rest at smith wrwound d t be this we ndfrth reacht fthe sefis

At n gramf t d vs fter perati state gp t acy of the fist | At the mill ant ry mag graft

nec ssary in d h dem t I r these reasons a method of blood vess 1 n stomo s to b successful and practical for war use must be easily adaptable to the use of vein grafts and f any i gth Th nonsuture anast mos s fulfils this requirement and unl Le a sutur a astomos s a con derable d's propo t n siz betw en the graft and artery : no way c mplicates the t chnique and effice cy of the method Th majority of the wounded soldiers will h ve intact veins which are suitable fo se as grafts such s the cephalie ver for anastomosis of the com p mon te arter es and the ext mal jugular great s phenous and femoral ver s for the anastomosis f other arteries These ins m y he rem ved quickly (in from t enty to therty minutes) fo use as trans pf nts to br dge arte ald fects

Ca histories presenting the application of the t e method emphasized the need for (1) m mediat co tol of h morrhage (2) te tme t for sb ck (3) control of pa and vasospasm with p pa verme hyd chloride (4) chemotherapy (penicill n is undoubtedfy the p ferable age t in these cas ) (5) preservat n of a lowe i temperatue in the w unded e trem ty (6) p sition of limb (when at r st in transport the l mb sho ld b placed at rest 1 a po tho from 4 t 6 1 ches below the heart level this elevates the v us p essur in the ex t mity just nough t d tan what I til blood may a v via th coll t rals f complete deo yg izat )

Irri-at on f the distal vascula tree with sal ne sol tion conta ing pen cill n and hepa in wash ut co tam nat d thr mb fr m dam g d veins a d pf ces penicill n in ad quate co ce trat n in th

The second peter deg gabast retomy shwd th eff ct of h morrh ge nd pdly de veloping shock Ea ly in th course of e ents a ig nifica t decl ne in the int m cular p essur ma fested itself dp dd the appe ce of pe i phe al c reulatory fail e Al ss of 590 c c of plasm ď 8cc of tot 1 bl d 1 m was not ccompa ed by ch cal s gns of hock. Alth ugh ntramuscular pr ssu e n s h g n g to d op th ven pr ssor mech n sm had not f l d The maxim l delnem trammucul pressure ndflr fthe venopressor mechan am coinc d d w th clin cal d ces f per phe 1 reulatory falure Thi cu ed despite a sto ti nof 272 cc fth pl m v lume hy the u e f a 500 c e whose bl d tran fu in The estoration f 745 cc. f the pl m vol ume by the ue fa cooc whole bl d tranf si how er coine ded with clical mp ov m nt Ad

cr ase f 200 cc of the plasm v lume n the first po t pe tt e d y was p es nt with an d q ate p ripheral ci culation. The v nop es r mech n sm was also ompe sated. The cli cal pi t re of p phe 1 c c latory fa lu e co neid d with the f I of the v nop essor m ch ni mr thrth n w th th 1 s f 590 c c of the plasm volume The th d patient und rwent a right neph pery with minimal p stop rativ dep ession. De p te

I ss of 205 cc of plasma volume the ch cal c nd t on of the pat ent wa good and th re was no dince of peripher i circulatory fail e Intram a cular pres ure remain d unch ged h fo e du i g and after the operat on The ven pre rm hans m did not f il

The e can be no doubt that much conf si ne i ts as to the caus of the condit ons fou d in the co is of well dev lop d hock n the hum n being Fa l to study the se ond tons in man him elf la g ly resp n ible Th re ems t be no do hi that th arly st phe menon n traumat c h ck n d gs duet a educt on nth blood vol m b tth sne d n tb th ase n ma

From the robse vata as the authors conclude that d ton a pla ma vol me ne da the ne ly cha ge no an nitiat gfctrins gcal h cko sho k f llow g hemo h e nd su g cal ope at nin the humanh g that periph al ircul t ry flue can be vid nt withot ay d t n in pl sm vol me and th t e ta degre of dec

in pl sm vol me can ist with ut p d e g c cltryfl It als evident tha d ct n plasma lum will be f nd lat hock

dly gn nt f th true fact is whi h ont of the n pt n and p d t of p phere l tory f du n ma Thesdet the fail t tudy dequ t ly the dyn m cf ct rs fth p pheral ci culat n in the human b g U t l c ntly all att nt on h sb nf cu do th d d pla m v lume and on t atment m dat est th blood lume It 1 ev n q esti n bl wh th th well des ry d popularity f h man pl m treatment of hoks ff ct d thr ugh a est

of lost hl d v l m beyond th t which the v l m f pl mag en dd to the circulat o ll m n pl m ho e e h m ked p es or eff ct on th ınt m cul pes e

The authors d ote a po to of the rart cle to a w I th & own fact conce 1 g the dy amics Ith p ph alc reul ton el ted to chinges the 1 t am scula pr s ure in m Am ked d op m t m cul pessure which ch dats m mum hetw th's thad tw ifth post pe to e hours was cn t tly fo d ft s g al pr dures Unmte rupt d'se l' d gs f tram cular and en p ssure m d d g and alter

p at nup to th d elopm t fsugc | hck h w h pre r lwr po ted by the authors The lest a d first ph ome on t death d pet rpecd gibe tof gals was del nihl elofitamuclipe g al shock The occurred in f m to ty to ty m tes alls i fris fi m nute ft th p ti bgu The tphome oted wa th del e which lay fill dith t f n o pes the intron cuips by f m st m ts The fomrtm want displiyd elpghch which hpped the op at g table The fall; o pre w oted that two man t s befo the gas of p ph alca I try appeared Digthe s ip ten ce due thei tid di fe that f the tr mu cular p ess ewith a 1 teres! of fifty m ute A gn fic t lat d p ospessu ccu gin the h d dow p t (Te dele h g po it ) san nd ato of a i l ig no sret m The blood et r gf m th ts sipo dint the gretvers narth h t (the pre nt icu! every fy n Recki gh c) Af iling ve u p es 1 th po it 1 d cates d cr as dfl wofbloodt th pre tricul reservir A pd decline n pe ure ccu red n2p te is form a c mp s t d hghl l with tho t f p ph rat circ lator; f l — i o it b p d while the pat tws till 1 th hadd

lrad n spes es courred ft th t ldc and c incid d with th app ! fpe ph al criltry flre Th w tru whithir not the pass es doppdrpdly! w dlyd dthe ymptoms d gns of sh apper de rly or late Those p t nts who sh nly see d pres on aft r p to s bt l ly loped p ripher I circul tory f ilu b twe the

pst

Th I west por ts tt : d by the t

s thand twelfth post p at h rs whe twas n ted th t th 1 t m cul d n pess es had cund they to dth m malpot of The periph 1 circulat d cl p at n appe d ad q ate hut s b tly the lin cal p etu becam indist guish til f m that se in pati ts wh de I ped sh ck

polly In b thust pes reas low as rem fw te a dit mucul pess e dwt codd Th 8 mm of w te h e be I west le I f tamuscul pes r i h ck c

cur ng before d ath The alte ation i the intra m scul ra d ven s pre u es noted in the dynam cs of the ven pres o mech i m du i g and after op ratio sho ed a consta t coincidence between (i) th loss f mu de tonus () a loss of o us p es sure and (a) the appearance of per pheral cir culatory fa lue.

The stud she er described a d cate

1 Whin certain limits a considerable reduct on f ci culating blo dvol m is compat hie with an efficient v ou ci culation p ovided that the intra m scular p essure o of the fo ees important; the dyn m cs of the periphe all c reulation is hild at an adeq atte by

2 A physiol g cally effective venop essor me chan sm c cides ith an adequate per pher ler culat on h i one that has failed is coi c dent with

the appe nee of urg cal shock

4 Hum n pl sma has a d e ded pressor action on the 1 tram cul p ss 5 N k th m de ls 5 N k th m de ls 6 the 1 tramuscular p ess The pres o actio

o the transactions per so and per so active to one his ded m it is and the admi state on of 300 ecolophasms as one arrybefor other pharmace gode etion beto mes made (see The effect of a technique on the the holis very rapid It also hight as the van per mecha small that from five to ten mute fit it it a e o's administration in doses of from \$t\$ cas a transf d to the see nay to o his Inclum utter q differentment.

6 The pese ee rahs e f the dynam e factor of the e er culatin (first the rate 1 vel of

the intramuscular pressu e and late these of the outspecture corresponded more clossly to the appeara ee or regression of penphe all circulatory failure thin did changes in the plasma volume amounting to less than 590 ee (appromately 2 units of plasma)

The authors helieve that the chief lesson to he deny of firm their studies is that greater emphasis m at be placed on invest gat ons of the dynamics of the pe iph raller culation ather than upon the volum of blood the tiss was take for the circulation and this m at he done at the hedside

MATRIAS J S IFERT M D

Diam d L K a d Ahelson N M Th D mon atrati to of Anti Rh Agglutinins An Accumt and R pid Slide T t J L b Cl M 945 3

The dev I pment of ant bod es against the Rh factor in the sera of Rh negative individuals may r sult in a tragroup bemolytic reactions f llow; g tra sfus s of Rh positiv hlood e lls According to the authors the present lahoratory

tests for the determinat in fa it RA agglut in sin its ratio sensity e if vol is are inadequate. It is claim of that with the block ig test of We er and the incubation test am it ad g r sult in y be obtined in 50 per cent of the eliminations. This is beleved to be of to an inhibitor substance which is terferes with gillutiont in As a lithe authors hav devised a il de test

which d monstrates Rhs ns t ation in a high riper c at ge of tests than h retofore and thus gives a truer climical p detion of in vivo hl d reactions fiter transfus

B VJUNING PS INOPP M D

## SURGICAL TECHNIQUE

#### WAR SURGERY

Smirnov Y The M dical Corps in R d Army Operati n B t M J 945 75

The doctra e ad pt d hy th Red Army Med cal C rp s ba ed n the follo ing pri ciples (a) a fo m conc pt on f the gn de lorme t a d prog ess of dis ases a d of the principles of s gical a d the apeut c ork in the fild (b) correct a quence in the te tment fick do ded t va ou stages during their e quati n (c) th oblig atory emplyment of buef accu at a d cons st t med cal docum ts ably g the chand wo d d t be clas ifi di a tho ough man e a dth et e t m nt to he u ifo m at all tages of e ac ati (d) a single ch l of the ght with fo mity i m thods of prophyla is and tre tim at f th sch and to ded at the valou tages of e acut n This school m the based on all that is hest in modern med cal c nce both in th theoret cal nd in the pract cal spher

To ensu e th' gunshot wound i eated au guily as soon as po s ble the field u its a e org ed in such a way that the o ded are eme ed f in the battlefield e n under em y small arm and mritar fir and ge neall u is geen at stime t in the field medical unto 12. The peculiar stime t in the field medical unto 12. The peculiar stime t in the field medical unto 12. The peculiar stime t is not self unto 12. The peculiar stime t in the field medical unto 12. The peculiar stime to the field unto 12. The peculiar stime to 13. The peculiar stime

es gun h t ou ds a c mpl cated hy gas gee sepsis d shock Th cheft sk f th for ard m dical nits theref re to cmb t tious los f blood and t gi e prophylact c tr t m nt ag t the omplication find Fo thes cat gor es fw nded who requesperalizet et me t ( o nd f hull eyes I ws th rax the prin cpl log hon s and the lage so ts) the Red Army Med cal Cops h s ar g d fo the to b g e in all nst t to s begn ing with th mobile h ld hospitals pe at g n th ne of the army base The tatmenta dec t the lently wo ded and f m dical cases e dealt ith rat ly beg n g th the f rwa d nits M b'l the apeutic field h spitals d mobile field hosp tal fo the slightly wo dda ac mp entpat of th m d cal serve of the a my n the field

In g ne al the Ire timent [w u ded t the Rd Arm) bad a system which del with e chage of vacu t n to a defi t dest to n The system cons ts n d dt g tr tm t ntt mush br f stages with t the est bli ham t f spec I zd hospital and dp tm that a destination wounded e te to de to all the stage the wounded e te to de to a the constant of the

ton at the foat T atmet 15 cm at the stage of as atoms consist t a doc coult e pegres a na sepe a d meth d as th d t neef m the f; w d m d call state s crass It; es; mpor tant to steet the fact that the cope d m thock of the stage of the s

The slightly wand of that can be a sted at the army has a mimmed tely to all call host that now ded end gap to lized it atment as dated by the sted gath of the

olation hosp t ls The n mbr f hospital hed i fild hae ad rear are hosp t l d pend d ctly o th n tu of d the ge ral st t at th f op t D g the first ph se f th w fre ample hn toops wre withda gund th Ru pec the t to dem ddth tth m mm n mber fhd be t ednth fild and b hosp tl Whe th Rd Arm, um dth off to ck d veadth t fad a cet th ces ry ot o ly t make a gre t it b cam crea e 1 th umber of bed 1 fild darmy base hosp t l h talso gre tly to gm nt th n mbe of hosp t l ts in thes a as

The f dm ft oops f m p dem cd ases d able et et the thm ly a tay re ance f the t tory lb r t d able et et the thm ly a tay re ance f the t tory lb r t d able et et et and et al. and et al

dth lim t n f d thn th a my a do eu dr thed ct fth 1 my 5 n tary Epid m c U t which has pe l ct att ch d t th v n us army fo m t ns The t ef eed m

f the Red 1 my fr m cp 1 m c lisca s ha bee ach ev d by the s mult eou a lc rrelated ctivity f all ts concer ed and is due to the fact that ant p demic me sures among the troops are not carried ut by d vidu I speciali ts but by th Med cal Corps as a wh le

IOS PER NATMD

Graham J D P High Blood Pr Lanc t L d 945 248 39 realt B ttie

The blood pressu e f the normal sol li r th n the gelmits feghteen to forty 3 ar ave ags 12/8 mm Hg P sures ab v 155/9 ld tle pesus of 100 mm lig were rg dd as

hypertens ve

The p esent in est gation not d the eff t f one va of acti warfa e nana mo d br g d 1 the With Deet The restig blood p sure pise dhim globin e dings we e taken of li rank if Hers n mb r ng bout 605 men fr m fo t e ght weeks fte b ttl

Among the latt r 26 9 perc tweref dto h datole pressue f oo mm llg or g t and 38 per c thad a sy tlc pre s e exces f 160 mm Hg In th bype te s v group 21 ga e ympt ms of he darhes palpitation and d sy pells Aft a cont nu ti f the est period it was fo nd th tth mean blood pressure had parti !! turned

t normal n 28 hype t s vesold; rs The t d c) fth bl d pressu et r turn to rmal n pit f chang 1 I mate li t or dehyd at ndicat d th t this as fnuog corgndet relff pers 1 lets B Ju C P S

dtlut ht n W R S Abd m Walk in ling et atth B fl spit t / /Lod 945 48 99

Thea there reve co consthet to tf d the compleations he had a logical so olders ompleations in a deviped 55 outers (wind dithe bed in a during the amp gill and the L v Countre) ft they hid are edited his basic lospitals in the U ted King. d m The go d c dt n which the patie to dat the hept l attr buted t the tih al mpl ym t of blood pla m nd al n inf

T t e gast ic suction \ tem c | e | l th apy d t the policy f vt 1 g or clud g all w u do f th larg ntests

Iti contended that pat nt ho ha e h d und f th abd men or f th buttock h ld be m lass asth y a e cttle! I fa d that v toward sympt ms s ha ps mit g r h matu i mu the account if a well say e picrat rimpe t cli iv my be taes llab cess thablm t ftcd wud hich is lagaleq at ly

Thon to fomt g delely p hulds g gest cute test l betrut n is a dhesi bal n l f m at 15 t th l g os balnif mat it thiges lpartmy hill with t

Clos forlist to I ffealt t las tf th ftl it th upperp tef the mall i tes tine may be del 3 d u til an opportune time The p tents g ral co d tio bould b adeq ately resto ed first

Scrupulously caref I technique bowever is essen to lafth operate us for closure of fecal fistulas are to

b unif rmly successf l

S p apubic bladder fist las usually close spon taneou ly but befo e th tube is removed it is essen t all that the w unds in the bladder are healed and th t th e s no obstruction to the urethra If the bladder w ds have not h en sutured at the pri m y peratio thei mai requer pair later

Abd min thorac c ds after their cally treat p cul ar problems the injury to m t present each cav ty requi g att nt as a sepa ate entity prov ded no c mmun cation between the two cavi tı s p rs st STF HEY \ ZI M

#### Ma F t ne J A Compound Fractur In Wa 1944 La ! Lo d 945 48 35

In a gr p of 120 fractu es among the Diepje ca alties the i cile c f steomy It's following Trueta s method of tre tment w s bout 12 per cent When there s a d cr ased volume of circulating blood or a I cal inte fe e ce f ci culati n due to thrombosis or a teri I damage an tensı vc pen wound is much mor lable to i fecti drugs a d pe c li n play very impo tant role but th surg o still mu t ca ry out basic surg cal pri ciples A nvi ble muscle should be rem yed and every bit fv bl sknm st be sa ed

Ag t majority of pate ts with compound f ac turs rach d hospital in Engl nd with n six days f the r be g dd Bur d sutures were not u ed c pt t i g te nocca o al essel No effort as mad't close the u ds The uthor p ints o t th t the ntenor b rd r f the t ba te don d ther tructures f th d rsum of th h nda d foot bould be cov r d as soon as po table b cau e they te d to do a ry b dly if left open that plates d sc ews hould n the u ed unless it sab olutely

eces ry that p p 1mm bli tion s e of the ca di al points of s ccess and the the open com po df ctur w u d bas been closed successfully fter a p rood f two mo th

A s rvey of 200 cas s i comp un l fracture i Ca ad n ho p tals in E gl nd was made Cl sure was su ors ful a 8 per cent of cases Fractu es of the f m we e closed s coessf 'lv n 7 4 per cent I cases a d fractures f the humeru w e closed cces fully 1 88 p cent of cases Among 44 fact e I the lower leg 8 cc ssf l closure wa hta di 68 pr cent f cases and amo g 23 f ac tures I th I am 9 per rent wer s cees I lly closed Se ral fract es in 1 ing both bones of the feg were; the neat f et re gr up among 14 cases sat I ctory res its we btained in o ly 7 The a rage; t real h twe pr m ry s gery nd clos

fpe ill a th g m tuel fom p m ) s g ra ntl complt n of thera; v bich as accomplished in a a g peri l ft n a d

eight tenths days A little v o e b li of these cases received an average dose of 27 gm of sulfa drugs over a penod of s z days In the Ital n theat 9 fone group f 3 f the swee closed and 71 of these were closed successfully a lated to close a d f thes nly escap d h n mf tt

During five years of war the c has been change of opmoin f in the clos of plast r to open wound t atment and now to del yed closses of the control of the compound fractures. A gre t sage has be a made in b thilf and I mb and a red ct in a hopstal days. The c i hut wid ance th the change of the control of

RICHARD J B WYETT J M D

### OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

B njamin H B Ahrenberg H W and F ir 1 s G J The Submu o al M cellat n f H morrh ida A S f 945 39 M thod empl yed in the early Soos by the

F neb surg ns a estill nu f reh surgecal tre t ment of hemo hold h rly eryone has hemo rh ds no nee form o the r and the c mpl cat f hemo rho ds nd hemorrh id ctomes m y b

very d st essi g and oft times d abling
S nee the pre ent war the authors have en may
you g men devel p hemorrhod b aus
det nervou tens n d! kof proper t letf c h

In vew fithef it the morthoods site in loe it and are in timb venoce vins fit rectafae at its discult done the per of by our fe damp does no Sance the duse e softh blood v sel primarily ther is n if it is ug on it some if he sug on it some if he ctain sund by goom it vise and van is of An pi nelocy which that is su con when attempt good to the part of the lower that he was a datum in self and of a sit with the control of the site of the control of the site of the control of the site of the sit

been that the main quale f bu mrh dec t my hab n d cd to a mammum a d the op ation itself h be n rpn mely simpled. The eith tc f h c is card l hl ck local inflictat n a d hep p s is a faxe b n the the lith tomy the Bu p ta A faxe f l p to cop c a m ton is r tny carridot t is rous anal dult s no dine A mell ar cs in perpendicular t h is of the ct m

n rmally f n to mg ctal t be Th result has

mad with the knil in the sk ppr x m t l 3 cm from th base f th first extern I h m rih id Th incisio lly just outside f th p m ted rea which s rrounds the us rappro imat by 15cm f m th mucocuta cous bo d \ t the medal dg of th 1 c sed sk s grap d with a \lls fo ceps Hold g the I reeps up on th ha d th muc us membra e s ds ect df f m the hem
rhodwth M y c sors Th d t s the car
ried pw d lk m w th th fige in th ct m gu de ntil Hilt l a h d Th compil h d th nti d d hem rrh d l es s lis moelltdby htbtes with the curs
After complit caflmr lit these sors ac withdrawn a d y d nd t e cess e muc us membra e is r mo d w th \ haped exc s on A mlar p cedu 1 carr d t th m hm h daltags Anprea egau pekmayb s tdfrhemost nd m ed th fll morn g H t sitz b th st tut d the th d day HARRY W. FIVE M.D.

B wn M J Surg ry t High Altitude Am JS g 94 67 436 The St t H sp tal at Camp Hale 1 th Rocky

Mas Cl do us of the local frth rp th httud of the hose is deed fn 76 mm of mercury to bots mm m c vy Thep taged, when me the rs b tth me at a lil thought the second of th

With the pinal anesthesia the element cophorato's chain aming and pillotte possible of pillotte process of a pillotte process of pillotte pillotte process of pillotte process of pillotte process of pillotte pillotte process of pillotte pillotte process of pillotte pillotte process of p

101 postoperat e complications among olo oper ati ns Of the 193 postoper t ve c mplications o8 were conc in d with the respiratory system. There we e 4 deaths 1 of high was due to pulmo ary em bolsm the s cond as de to edema and p t chia of the hran the third and fou th deaths were due to severe chest tra mas. The sterilization of mater als

d 1 struments was carried out in steam pressur st rili ers at f m 18 to 20 pounds of pr re 1th temperatures of from 24 to 5 F a da sterili in

time between fo to five a disixty minutes

Clinical laboratory results sho ed a slight ele a t on in the r d bl od cell count and hemogl bin Th d fferenti I blood counts sh wed no significant var There were no evident cha ges in blood

The general surgical 1 one requiring operat ins were for the most part con emital defects such as hern as hemo hods varicose vein a d varico celes. There were 35 hern a (inguin l) repairs among 189 men in eighteen months Amo g 235 hem a repars there were 5 prim ry w und in fect ons

sed and t ated 25 The med cal service d atypical pneumonias. Amo g these were a pl ur l effusio sand a empyemas Simpl ff s s requi d f om 1 to 6 thorace teses O of the empyem flu d cultures sho ed a rule t hemolyte strep tococcus in which x ray t des demon t t d mul t ple pockets Repeated asp t s f pu the l cal t n of pen cil resulted in cure thut fu th mpl cat d by mass e pleural eff s n r 300 cc f thin p s were asp ated Repeated aspirations a dipe icillin the apy local a dge al have resulted r c v ry RICHARD J BENNETT J M D

Eil ingt n Wil on W Spin I An ig in ine ry Y ung and Fu ther Obs rv ti ns P R Sec M Lo d 945 38 09

A ca eful record of r 600 super 1 ed cases of pt 1 a lgesia with a light solut on has gi e the a tho a simple f m l for mo e ccu te t mation f th timi gins d nece ry f bt ga esthesi mall grop fb bic dv y ng child nclud din the s es

The ad nt ges of the hypobrc of the arc ts tho gha tom ticm x ng na sho t t m ts rap d its l asce t ndits l t cty The do g 1 bas don the l gth f th spefm th furth thorac conne to th fu thl mb p with th patt tin the tical inclued 1 mb p ctu no tin the from 5t 5/2 inches the er ge male a d from 4 to 14/ h s 1 the e ge f m l frall light n pe can olut o th frm la 5 for spinoca it i Th umber of ches i m ltipled by t g th mb f c o i h n p came ed When I w sp al a esth sas to be g no half th t m g of the high p all us d'nd hen middle pin l es this c t Do-10 sto be gie the furths of the high pinal timing is used. As soon as the i j c t on is made the patient is sat bolt up ight for the r mai i gamount of time the time in econds being commenced as soon as the 1 3 ction s started The 1 1 ction must be completed within fifteen seconds

TABLE I -DOSAGE AND TIMING BY FORMULA FOR SPINAL ANALGESIA IN THE YOUNG

M ! M	B k to 4th thoracic pin	Tim in seco d high pixal	Dose pe cas 2000	
5	3	5		
5	4			
5	5	5 5		
3	6	3	3 C.	
5	7	35	4	
5	5	4	6	
5	,	45	7	
5		5	5.4	
		55		
- 5		60		

H h pr 1 th term 1 this madeposal of this low poal to otherem
be nat lumb segm

The author's experi ce s l mited to nupercai and spin car the latte ber g pref rred because of its greater st ength There were or per cent perfect spinal analgesi s with alcohol c spinocaine as c m p red with 85 per cent with 1 500 up real e The advantages a the add d t e gth and effects eness the rapid c mplete mixing the small dosage need d for exact block levels and the usefulness in un later ! spinals Nupe caine s reserved f r the l ng oper at o spi oca ne for the shorter a d most otl r cases a d for un lateral op rations nd pat ents re quing v ry accurat blick limitation. Wa ming f the ampo les is not c n idered necessary

Trendelenbe g slope is c nsidered in 8-d g adeq ate i btai ing anesthesia g e ter tilts th n

5 deg es bei g dangerous The prone po ition has no place in the techniqu desc ib d it is an unnecessa y and u justifiable ma p lat f the pate t Test g f the height of the bl ck bef e operation is considered un eces ats exc pt f ccas nal demonstration Repeated careful sp nal a alges a h s do e no harm to th ne ve t sues Compl t f ilures in the whole series amo nted to a pe cent with only o 5 per cent in the last 400 cases Such f 1 res m st b due to ntire xtrad 1 ny ction

By alternat g the pos to nof the table and varying the tm that thep te tisl ftin the late al position u il teral block. I the foot leg lower | g a d whole thigh can be obtained a coessi lly with pocare

to de the occurred on the tabl P emed cat n is of u ed n the poorsk and is cut d n t a m mum if used at all in the cry elde ly M nute controlled doses of pe tothal are us dif requir df

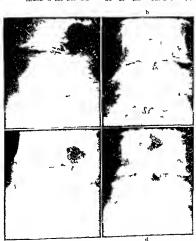
s it and r produce the r ntgenorer ms
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gated sitt with an irregul cross secti s metimes t appeared to be rou d roval To me case th powder as se nat the ante ior edge of the ve tebral body which suggested thit he curett had actually approached the an ulus fibros s Roenige grams taken of pat ents m inthe after though all in ertion of tantalum powder showed no imificant the g

To date there had been no opports ty to ecamine a case with symptoms ggest ig recurrence f a protruded dic. The has be on oscquehe following the implantation of tant 1 in powder In one case it was possible to rexamine the te he re in the tantalum pode he dhe n se teed This pitent develop d an the ry otruded disc adjacent to the or gual Curettement is all a patients with the control of the cont

Niel en J and Strandbe g O Roentgen Treat ment in Cance 1 th Laryn At d l Stockh 94 3 89 55

treat Coutard's protracted fact al roentg ment of ca c r of the laryn was first adopted t the R dum Ce trin Cop nh gen i 93 5 ce th t time ab ut 600 cases of t mo s of the pper re pa tory and digestive t acts have been t t d among them 63 of intr laryngeal caneer These are d cu sed part cul ly fom the point of ve fdtr ming the comperative lof surgeland cot g treatme t The hist is fig f the pati ts given to llustrate the uthors class ficati n f th tages of the condition a d t h the ite d extent of th tumors in p tie ts feed f sympt m Dily ir a lat ons we egi e e pe ls 131 g form the to eight weeks with a t tal d ge f form 5 000 to 6 000 roenige o 1 s m c ese n 7 000 roenigens Thet mo d em tb atl tirom 4 500 to 5 000 roentgens The 1 e f th fild was f om 5 to 80 sq cm din me cases as low \$ 35 sq cm P t ction is de i ble i d t p t t ormaltisues I afw cas sth a th

d sup rfat at dt tm t w th f m 6 t 7
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Ill strat egge whe hashow the tes of the tomora and happe either to be free and after tree timents a mb fears. There be for a factive timents a mb fears. There be for some the series of the series o

ug the thors could that caner febels ry st g the ug y roentg at e tm t may be d b t fth ca cer is n tvry small and

I cal zed to the middle one third of the vocal cord roentg n t eatment probably is to be preferred. In stage 2 the Coutard tr atment is to be preferred as it ems to give results that are as good functionally a das lasting sin stage 1 In stage 3 the Coutard t catme tis to be preferred in carci omas of the fals vocal cord which metastasize early and are quite adiose sit ve This is a g od radiological can cer and a poor surgical one. In fix d care nomas of the vocal cord urgery m y be sed if imm bility i complete if it s not complete a test irrad ation may he used and the final decisi n het een surgery and adat on may be hased on the results of this In cases of mo e te si es hel the carcinom s larvn gectomy is to be preferred this is a good surgical ca c r but a poor rad I gical o e Ca cinomas f of Mo gagni re intermed ate het en the st those of the cord and thos of the subglottis As th y metastasize quite ly a test irrad ation may be t ied In stage 4 irrad at on is the only possible t eatment e cept that tracheotomy may be used as a pall at v m asure The only cases in which f ee d m i om symptoms can be br ght about by e ra t e r di tion are thos f the fals v cal cords I other cases the greatest relief is p ob bly to be ob tand the small p ll at doses of ir adiation AUD BY G MO GAN M D

G) lst rff P tersen If Th Roentgen T eatme tof C reinoma of the B at At sdiol St kh

The auth r discuss s the esults of treatment f care noma f the br ast at the R dum Cente in Aarhus 1 m 9 4 to 936 w th a view to determining th val of post pe at roentg n tr atm t Duri g thi period 6 t wom n were t eat d for ca c ma of the breast and 3 men a d 4 omen for sarcoma of the bre st The material s divided int 3 g o p acco d ng to St inthal's classification 25 2 cent of th m tral as in gro p 1 58 5 per ting o pll and 16 3 per cent n group lif fi se surv al rates for these the g oups w re 43 7 and 4 per cent resp ct vely The materi l was taken f m 47 differ t ho pitals nd the b st r ults we e obtained in the pat ents perated on at th Aarh Municipal Hospital the five year su val rate mo g these being 73 per cent Thi was p obably d et the fact that at this hospital adical pe at with remo I of the axillary glands was pe form d cons st ntly Anoth r po ble f et was that post perati oe tgen tre tment was g m ch lier after per ti at this hosp tal tee d ys after operat n n the average while t the othe hospital th ty-eight d ys ft ope ation as the a erage Tr tm nt for recurr ne or di tant metastases was given 1 120 cases and in 8 per ce t of these the was a fi year surv val rate m the date I per too The e wer 113 inc rable cases Thes vere tr t da d good palliat The e wer 113 mopeff cts w e btas ed but oo lasts g cures result d The results we poo er in p t ents nder f rty 3 ars I age than in pat nts up to sixty years but

r v al te por 1 c a vara d typ alfactu e It 1 of interest that f no syst m the exammata n s made the f acture sometimes is not di v red until s veral months later when it al eady m y be n the p ocess of h al ng

In on case part of the bone was remov dfrom the futured a z fo mucrose p cat dy It was found that the bone marrow v as destroyed and the pc ture resembled that of oset us fib o a leading to n crobios so necrosis of the osseous tu we The was no cellular r action and the ost oblasts as well as the osteodatist w e complet by ab ent This suggests to the author that the pr many cases of 1 J ry the direct effect of the receigner rays on the cellular lements themselves. The nutritive disturbace e ulting from the vascular changes is a co trib tory

The conclusion ached th tos us chang f the neck of the f mu rep es at po 1 complica t ns of h avy irrad at i du ing the t atm nt of ca c noma of the cerix ut twhen e e such p in nts dev lop p in a the hip o a distribed gat without the eb ng gynecol ical evid nec of recur nec of the carcio mar i ray exam at on of the b I

## vis should be made routinely TL UCUTIA MD

Thyges n J E Vld b k A and Vlliaum I The I e tm nt of Leuc mi with Artifici ! Radi a tly Sodium A ! d I Stockh 944 5 339

The 1 ternal d tion th rapy with a t fic at rad oactiv sub tances offers the follow g d tages

I By enteral or parente I admit a tation f the rad oactive subsit of a far moeit mate coular between this u e f the add tion of the object sestable hed than can be but ned with the u al

r d m the apy 2 As the half I ves of the art find I r d oacts e sotope with a few except us e ery hot com p ed with the half life of r d m th i fet a the o gan sm so ly in ted in t m so that x ctdo ge spo sh d sw k ow they for the second rounder of the company of the second rounder of

3 The ternal strad to can be given so that its first ill be eith chefyl cald more gene led a oding to within the sotop given naccum lates ic tai og ns ord t butes stself moed if uely. The localized stradit will dit he to e switch will be of ge test it est fo the app

A firsps bling for itsely ryst mit Ep mints ndras in gentle der dit with itself and and itself and

5 Th cuts ou e ctins es hi f m th usu l oc tg n and d m th rapy 1 d. The fren ny trubles me ray; t icat cau d by d ct rad th rapy; een ly a mide l m w th l rge does of rad o tie s bst ne.

6 Th ready d speedy application il sa e t me and a many cases will make t pos blet trat

th pate ts n an ambulatory manner

A drawba k to inter al rad um therapy the first 1 rad oct e elem is might be fid in the large a d to the apparatus required by the sam drawback apple so to a certain e tent to the rad at aton the py. The rad oact es betone careadily be traspited project the transpired project for the rad oct and the rad on the transpired project for the rad of the transpired project for the rad of the transpired project for the rad of the rad

t m within which the s bsta re deca s The only artifical deactive otope a deof frit rnal tre tme t i leucema s ad onh phoru Pn ap betaray mitte with a h if if off ut en dith eet th days The autho el an the sub tanc r d sodi m Nat h ch m t bt rassadsey h dg mm as hade tha thos from r dum and ha ah lf l fe of fo t en d ight te th h is Th ma ne fit di trit to in tham I g mas differ thom that of most of the othe a time Ir dioactive 1 otops Whil thes accumulate mo o less n diffe nt g rad o-sod um fou d Imost e lu ively i et o intacllul fld thitits distribt a d yacti i diffue In co t ast to adophos ph rus hich yso la sth blodst eam an almost c n ta tivis bt ned with ad sod um a soo as fift mi utes fter its i jeto at the The e cr to which takes place tho gh the s very l Rad sodum th rel e s ms u e s very l tobstblefite igeerindt ofiw nt tv It pobabl th t th grat t me facto b em yact b va of s as tiz g the le cem c tis o that the magn betwee the the ne tica d t n d ses b c mes wid E ter al allov r tge t eatm at w th small f cti n I doses b s al cally proved of al in luc mia f xampl n ca es the the decome mo o less fet ry to lead irr dations but th m th dp esents t ch cald fi cult es bes des b 1 g exp n ve

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is ly all f the gamma adat as it.

E the pair is eet ated whird a it esod more than a continuous the polyculm are after hings add it with polyculm are after hings add it with physic geal d mehi des it it due fare eith but east look made and the part of the p

gvnatit rv is of at least fo ty ght hors

Untowa d reactions following the admin stration of the sub ta ce were's idom obered in fact they occurred only 1 connection with 3 mircti ns In 1 case the pat in the came nusseated a dhad as ighe attack of vomit g after receiving to milliour es by mouth 1 a other there was age erals en auton of heat light pursp r 1 micrease of 1 mpc atturned to the control of the second of the

The ffect of the artificial adoact e substance on the hemoglob n percentage and the white blood count was as follows the fall in the white ell count and ther m stoms be rid vere sim har to those after the e po ure to rentigen rays. In the cases of lymph tel uc mat th hemoglobin pe c tage was almost unaffected although rad sodium spe dly count me de of the thrombour of the count of the country of the c

cases xcept Case 3 (which later pro ed to be I fractor, all o to rentgen to extement) a marked effect in the number of leurous tes in the blood especially after the largest and most frequent dose. No effect on the differential court could be detected. In several cases about a week after the bigining of the tre truent an increased swelling and ome tender ness of the palpable lymph in des or the enlarged spleen was noticed and this. Vas followed by a more

specia was notice and in a vas injuved by a more or less of stanct of minut in of the size of the or gams in question. The change in objective find gs was acc mpa in d as a rule by s bjective impry vement the patents hecame stronge and the itching of the skin and the perspirat in grev less or crassed alt g the The flect if radio od um on poly cythemia we a it as

o lyslight nd trans tory
The number of ca.es I leucemia tr ated s yet to
small and th time during which the patients have
been observed too shift to warrant any definite exp ession in regard the permanence of the effect
described Shart M.D. Mary M.D.
Start N. Mary M.D.

e c lo teopor c v nd typ calfat It s f 1 te est that f no syst mate zamin inon made the fractur s m times i n t di co e dunt! s e alm nth l te when it already may b n th process of heal nr

in ne case pa t f the h ne was emoved f om the fractured area for m c oscop estudy it was found that h h n mar w as dest oy d a dit p c ture resembled th t f esteth h a l adi g t nec hios so recross of the essou t i. e The e was no cell l a tr a and th osteoblasts as well as th ost oclasts we ee mplet ly abs in The sug g sts to the author that the p m ry ca l n ury th d retefect of th mig n rays on the cell l lements th ms lves The nut thy disturbance cult g from the vascular change : e no butory

facto

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#### MISCELLANEOUS

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y t cat n wth plast c nems d ton steat nd the f m t n is c m

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5 The ctuous at result from the survey of the construction and red in therapy at the Theoretica very t bless me y nt icut near y by dectrad the apyr is a nonly mil of m with larged sess if duo ctie substate of 6 Th dy disped piptents n it may a dismay cases will make typosible teet the pt tism n mb itory manner

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so as fift nm ute fter its jets the vert who btake place throw the cs ry l Rd sod m the for sem to be the force the terms to be the force the the general time fact r be emay they way fe the gradual results that the mag bet en the therap ute and

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whip by with me a Air boing a causary with pho of goal of meltin distriction in the control of t

Untoward reactions following the administration of the substance were seldow obser of a fact they occurred only 1 concetion with 31 pection. In case the patient became naussated and had a single attack of vomit g after receiving 10 milliouries by mouth in another there va as general sensation of heat slight persp atto ince as of timpe attick and the sensation of the standard of of the standar

The effect of the artificial rad oact e substance on the bem globin pe centra; and the white blood co tw as follows the fill in the white fill count and the rems as no so erved were similate those street in xposure to roentgen rays. In the cases of jumphasic leucern a the hemoglobin per ratge was elemental discourance of the through the count made of the through course who has exemed to occur in increased numbers after treatme t with Na\* On the othe hand the ewas in Il of the

cases except. Case a (which later proved to be re factory also tor ougen treatment) a m-ked effect on the number of leucocytes in the blood especially later the largest and most! or end doses. No effect on the differential count could be detected. In several cases about a w k afte the beginn g of the teatment an 1 c eased swelling and some tendeness 1 the palpabl bymph nodes or the nlarged spiech was notized and this was I llowed by a mo e or less d st. et dim nut on of the 12e of the o gans in question.

question

The change in objective findings was compa
nied as a rule by subjective imp vement the pa
te is became stroge and the itch g of the skin
a d the p ispiration grew less or ce sed altogether
The effect of rad osodium on polycythemia vera was

o ly slight and trans tory

The number of cases of leucem treated; yet too mail 2 d the t me dung h ch the pate ts ha c bee observed too sho t to war ant any definite e p esson in r gard t the permanence of the flect described. Too sik Nax MD

## MISCELLANEOUS

## CLINICAL ENTITIES—GENERAL PHYSIO LOGICAL CONDITIONS

Bu ch G E and W n T Th R lation f Total In n ibi L of W ight to W t Lo f om the Skin nd Lungs of Hum n Subject in a Subt op cal Clim t Am J M S 945 09 6

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these les ons appeared as deep c reular r oval punch d-out ulcers with a pinkish gray granulating has The ulcer edges were extremely s siti e e en tho gh there was no infl mmatory reaction. When s v ral f these ls ns re prese t the legs r fo arm. a moderate deg ee of edem of the fe t or hand was pres t and fever ra g d fr m 99 t F T o survivors showed simil lesso on the p lms of the hands though newrs n nth soles f the feet on the neck or on the f ce The e as no tendency for these ulcers t coalesce r p ad

Tre tment cons ted of the appl cat on of ste le dres gs with or ith ut the use fan a t septie and ulfa il mide powde The final the apy c nsisted f ca eful cle ns g of the extremit s and the appl ca t on of sterile bo ic cid ointment a dp ss r dr ss

H alı g was slo Smears tak n from the ulcers sh w dfew organi ms No differe c in h al ng t m ld be ted in those cases n which ti eptics

ulfa ilamide powder had been us d n the initi l teatment n e tast with the in which only stenl dry d essi gs we e pplied Af kpyod rma dev | ped | one ease These lesions seemed to eo espond in many ways with the so called Iropical ulers or des rts s rp t df m the African the t of war

Th auth is believ that the salt wat most impo t at et ologic l factor in the p od etiof the eulcers \ tam n defie ency and delw e t e as dered as important No e of thes and duals pesent d the petu f imm rsi f ot s nsw eappar tly t baeterial i or g The p events n of sall w te lee is und ht dly d pe dent upon the p ot ction of ll e posed riaces ind viduals ad ift If il ble some bla d i t me tsh uldb ppli d to the skin of the e t emit es and butt eks a p pbyl et e measure by the nd

v duals who are cast adrift

RICHARD J BE NETT J M D

D be W L nd Nippe t P It Clinical Aspects and Treatm nt f Cutaneous Cancer J II As G org 945 34 5

The dath rat f m skin cancers d the metastases is compar to ely high and f eq e tly the physica as ell as the laym n is to h) m I a ly as llas lat malgati leme t fth sk 9 qu tly bel ttled by th pat t becas thas n pa the gr wth 1 lo and us ally the les on ppe is in ocent t the ind dual who h b erved td lyfrm nym nthso yers

ppe race of a ly cace of the ki sf que tly cof g en to th phys a a d many cas s are dag o ed moles warts fib omas or th b gn t mors Becau e of m d gnoses maytmrs rt ted ficts ly ntteat d

Exclud g m l omas the ln cacrs my be pleed 1 to two g ral types th h l-cll ca ci oma and th quam s cell care om Whl m

tastases are comm 1 th squam u -cell care noma they ar extrem ly rare in the h al cell ca cin m Ill a l sed surgery may cur th sk n cancer but al o cau e unn c ssary deformity Overzealous roent a dr dium ir adiatio s n t o ly deformi g h t may h dangerou Squamous-cell carcinomas

may devel p in sites of a rad odermatitis. These ca cers must be removed surg cally Surgical treat m nt sals r q red for ski ca cin mas that d I p in such diseases as xeroderma pigmentos

ac odermat t s chro ica atroph ca s I pus vulgar s a d lupus er thematosus Surgery is also recom m ded in ep dermoid carcin ma which ar ses i are s of scars f m hurns These scars consist of fibr tie a d el tiv ly avascular tis ue and the t m rs aris ng in these areas are not radi sen it v The authors shore the experience fothers in thit

rad m has no advantag over roentgen ray therapy kin care omas Radum is m e convenient nd for this reason more efficacious while dis as s located in inaccess ble locations is chias the e

1 ud tory me t s or th as 1 mucosa Three hund ed nd four patients th kin ca ce were treated and observed by th authors for one or more years Of the e pat e ts or had squamou Il carcinomas (3 per c t) and 2 3 had basal cell ca emomas (70 per eent) O ly early ca es f

q mous cell care ma r le ted

Cures e e obta ed in 97 7 per c t of the basal ell ca ci omas a din 8; 6 per e t f the sq mous cll ca einomas In th great m ; ty f the case the uthors us d som surg cal p oe d re or electro de secat on with cu ettage. This was foll wed by entgen ray i rad ation a d in a few el eted cases by rad um irrad at on With th combinat n of methods they obtas ed a high pe e tage of cures and als good cosmet e results

HK NAR

#### GENERAL BACTERIAL PROTOZOAN AND PARASITIC INFECTIONS

Eglhrn TD and Wilman WE Filari si In S ldl rs n n I I nd in th South Pacific Am J M S 945 09 41

The clinical peture of early fila ias seas based on bser at made on 127 American sold ers The cubat n per d of filarias s as d termined fr m th ymptom va red fr m three t f rte n months Farly symptoms we eu lagnos bl nd c n ted of a c 12 vom ting and v table pains espec lly th gon permatic cord test les nd thigh Within f om te t fourt en dys f the 1 tt sympt ms crotal a solvement h cam pp r nt 75 pe c nt of the olders Acute pd dymit and func litt wer c nst nt fnd ngs The co l c uld be palp ted and fo nd to b fr m two to fi times ts n rmal sze Hydroc le s not observed in Is ment of the s pe fer I lymph odes w s les fequ t. The corse f spre d was pe ith 1 f m th superfic al gu al nodes t th more distal nod's Only a sold rs dev loped bsces es Thes w dep with nume on pockets The pu was the nad greensh and chiad o domo strabl g nsm In a sm II n mb f cas s n ft n n suppurat we swell ngs er fo nd to ppe for recur nic n junct n w thu we a z Th blood count was n t character the cept f th it ppa un 44 pp cent f the cas s of an eo i oph h h ch are d from 40 44 pe

In the 7 cases muc ofil 1 and ad lt w rms w re not dem nst at d The e ly ympt ms d sc ibed subs ded lowly but were agena t d by rto and h i weathe R curr nees usually p pea ed aft r a pea d from one t br months These we em seve e d p rs stent Ah f these ac sw re evacut d a ly to th U ted States

Epdem I geal td s reve led that the dencidence dep nd dupon the pro mity them it tary installat on t nat ve ill gs. When c ntact we close with then t ves almo t sop re nt fit mittary p rson I becam infected in ne ervulsee 8 pe c nt of the personni dev I p d sg. of fiar as I whin a pe i d of tw I ven on the I nante willages the ned ee was 6 pe t t the end of the y ar It s belent he was for the start of the synthesis of the synth

In 4 pc nt fa res from natives merco file ages reformd in the blood. The possibility that leph int as swill occur: u ld research we ince they we immediately counted home thus reperted infection a limit ted induced to q le sel phant a bewe p clud d By years OF P SHAPTEO MD

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pe ods w n t not d Th typ cal c t if g l lymph g ti w s f u donly ot mes li th ms.

The auth r con l des th t the ymptoms and signs a ribed t filarias; n Am r can to ps in th

area m q e ton by me med cal cama n sag r th overemphas d nd that ther a e t i dwnd al cases the ctive stag th n F ca d, would deat The v ince processor that ce spras m kes ca ef 1 d flere t at a t 1 di ease nd p ewdolf as as difficult that the the c no way to p edict and dual el pes and processor in the above the dit cto of the causat e parast the d grown at each not seen at each of the flight of the fli

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p nicilit ap dly pas es i to the blood It is pooly b b d he g c ctally It dest y d by ormal gastri cret ons D flus the gh t the t sappears to be pid Iti el mated pidly i the ine ver so per c t of single dos bei g e cret d w thin one o two bours. The rem i der s app rently destroyed in the body. Pe ell i practically innocuou when used as r minended

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tion and continuous ntram scul dip Fo topical applicatio pe icillin his heen dissil ed nisal ne sil tin to a concentration of frim tipo ou its proubic cent meter. On timent base ha e all o heen in directions to the model and to the continuous continuous meters.

u ed sooun tspe g m of base. With the use of pen clin drai g I py ge c coll ctions can saf ly be del yed until the p tent is ideal conditio. The is left matastated cmi nat on or septicem a is m m d nc ff ctiv pe sull n therapy is estably hed Local p gress n of piogenic processes is usu liv halted snd thet tal siza of invivement is held to a min mum. The Bora

of abscesses is often changed by peaned in therapy to that with mixed alect in it in d. g. rous cocq are f equently limit ated. The da ger of dissemination at the time of u.g. gical intervent in its gratly reduced by the use of penne lim. This lower the after perform one of more radical procedures the after perform one of more radical procedures are the second of the control of the permitting the parents ally and topically off permitting the control of the permitting the parents ally and topically off permitting the parents ally and topically off permitting the control of the permitting the parents all procedures are controlled to the permitting the permitted the permitting the permitting the permitted the permitting the permitted the permitted

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A detailed report of the eff t fp ll the ap the valous 1 fect of f 455 pt ts signe S MUE K EN M D

W I ha M B and Cutting W C A Simple Techniq for th Eatim tion f Pe icillin in th Blood and Othe Body Fluid J Lab Cl II 1945 3 6

As mplificati n of Flemi g m th d for the estimation of pen cili i described

Eight small Was rim nn test t bes re et pi a

E this shall was run natest bes re et pla a st ble rack in each e cept the first ce f physiol g cal salt solut o a e plac d lin the first a d see d t hes o ce of the unkno whole cut at d blood a e add d From the co d t be accessed a d to too thind tube the firm the condition of the condition of

T each of the 8 tubes a c add d o 2 c.c. of a sus pension of bem lyticst proceed in broth prepared a foll ws

St eptococci I m a twenty four hour culture in broth are transferred by foop to fesh b th One I poist ept c cc is us df reach cubic centimeter of broth and enough of the suspension; I prepared to make a savs of all th unknown and control blood

s mples to be examined

Each tube is shaken and then when it is almost
boriz ntal a glass capill by tube about 6 cm long
isfield by any lit yact on fromit While the capill by
tube is still b ing h if h i out life the capill by
tube is still b ing h if h i out life the capill by
tube is still b ing h if h i out life the growe in
biden and by off modeling day to fell a growe in
place in a roy the boa d i turned so that the tubes
ar tup is hi.

After incubat on for twenty four hours at 37 C the tubes are 1 spected for the p esence of hemolysis

a d c l nies of t eptococci

To the controls a se jets of tubes as for the un hon a blood a e set up but defibrinated horse blood contain grunnt of penicilling per cube cents mit is sed in place of the unk with blood sample. The most of lut e introl capillity with ut hemoly set and bacter at colone is cleates the dilution of runnt of pen cilling which will high it the inoculum of stript cent in the preceding tube indicates the dilution.

The concet twon f pe scull n in other high die my hy determ ed s mil rly. Ur ne must be distinct before the estimat to bring the swally heh many n nel lin les lis into the range of the blood te els. U me so unlly dit ted with 9 parts of the blood te els. U me so unlly dit ted with 9 parts of the end point then det minded may haved and the end point then det minded may haved and cloy 1g owth The final values m at he cor cetel for the distinct fo

Galla d E The Sen iti ity of B et ria from In feet d W nda to P ni illin R sulta in t12 Cases II II d Ch 945 7 00

St ins of taphylococa from 12 cases of tra m te wound of the ext emitte and 1 fections of t owe ks du aton o m r all 1 which had been the ted with ne or more of the sulfonamited crystops to adm si on to the hospital way. See the district of the sulfonamited from ject d to st dy hy a method described in a preeport by the author (Sensit: ty of Bacteria from 1 feeted Wou do to Fen illin Mythod of Assay War Med Chi 1944 6 86) No constat 1 to hip was discoverable between the factor from hip was discoverable to them the factor from factor of resistance to pe icilia

of the Suprarenal Co te with D cripti n is Lase Alamed s d 94 Tum resolthes prenic te fqethe e

abnormal mascul n zat om It has now be n fo d that they often h ve I m in men A case of the latter type 1 desc ib d it oc cur ed in a man of fo ty f ur ho up unt I 040 had lived a normal life lie as m d and h d a healthy child en his sexual life hid bee in mil However for three years h s br ast had been in creasing in size until they we e as larg as half an range. In 1939 he began to be fatig. d. nd hav

functional dyspnea followed by a mode ate los f w ght as well as pan in the nte; r part of the left half of the chest. The breasts e e made up of fibrous tiss e with scatte ed gla d lume h the e There was no secret on Du g the co rs f his illness from his first admis to t the hospit ! on March o 194 to his de th fifteen m nihs late lib do and potency d sappe ed complet ly penis and testicles we e small. The was s derable increase of and g c h rmo e in th u i e and a enormous ne eas of est gne b mone the amo nt of g nadot pc ho m ne no mal The Friedman react on was neg ti t logically the tumor was carein ma of th 1 ft s prarenal cortex Photomics graphs f the hi to-

logical findi gs are given The ew em tasta es th lungs I er and opposit supr I gla d Six similar cases were desc ibed in the I t atu a da table is given showing th outsta dig symp-

toms hich we e about the same in all the cases P thological changes in the supraren 1 rt mas cause not only an inc cased prod ct o f n rm l sex hormones hut also the prod et on foth r t o d sub ta ccs which influence the cce rv tch ac t rist es Th saccounts for the vi il zi go f m mi ng eff ct of the e tumors Avore G M A MD

Luft R On the D termin tion f Urin ry 17 Ke t ter ids and Its Clinical Significan m d c d 1943 5 77

The author gives a ge cral revi v f th m thods f det rm ng androge c or m ul 1gh mone in the u me a dd sc sses wh the th d m st ton fs ch horm nes in the n sh w the functi al condition of the nd ct gland which s cret s th ho mo A pe f ctly r labl d m ple m thod of dete mig di th mm has ot y t been wok dout ho se th hem cal m thod based on col rom t : examinati h e ed supe for t th biol teal m th do Th u thrused a mod fication f Z mm m s n m l ch m cal meth df and n d te m at

H tested the rne f 7 h althy m n a d healthy women by the m the dad g es tables ho ng the det! I fibe es its Fo dn ha b en demonst ated nth wi Inth m leth v e cr ted I gely by th test cle but I t a rta ext at by the adrenal c te m m thy a excreted alm ste to ly by the dil te

dete m at n ther f e hould be of clin cal al in cond to us of s fliciency of the test cles mal a ddi ases of the parenal c ter both sees The this is true is hon by the uth descriptio of ca es in ufficiency of the test 1's in m nd fAdd d easeins om Inth m the was ag fly decreased ever to of a d alth gh a ti mount was st llexc ted I the st es f Add on sd seas wmnthee sp gres i decreas a a d scrtin This cot oud

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ho ed destructi n of the s p ar al gla d Two case of hype pl stic cha g s 1 th co t x of th sup a n I gland 1 y u g boys are a! d s hd Th p tients e e se n years y ars fi m nths of age spect vely In the e was a d ffuse hype pl s a of the c t sup al gla d and t th other c r of the supre le t v In b th boys the a drine ce t was g e tly nereased a d both f them h ed p mat e d lopment f second ry s l char ct ristics AD EYG Moa MD

Pi m P Spermatog n is in E n hid Vi Thirty Tw Years Old aft F Y rs t rs of H rm n Therapy At md d 043 536

Th auth does tknow of any pre 1 scase in which spermatoge es s has been establi h d i a adult unuch diman He describes the cas of a m fin ty-eght wh came to h m in 1018

This man had ver had an ejacul ton a d ly ccas I suggest on f se desi e 11 was t ll d l de withf mi i proportio sa dwasab t Lgm adern ght f r hi height and age lie a t td with b th go adot pcadt sticula ho

mo es with very go d eff ct Phot g phs b! e dafte fo ye rs of t atm t how the ch g masculi typ of buld in 94 he a m ried and he ha stated that his married I fe his be n no mal and sat factor) I the co se of th f r vea sh h sh ngiven 377 i jecti n fh ma al p p ations Afte m months of t atme t the ptethad an ejac lato a dafte iu ; is p rmat o app ared in the ej c late. The treat me twll b co te ued a th gonadot pic ho m as it reaso able to pect that the sperm t m yb comen mal q a t tatt lya dpo bly l q alitativ ly Th s f test cul r h m e ill be die tindasa ml pem tandel cal pe h v sh n th t th pr parat n decre th n mbr dmtlty of the spemt 2 a

## SURGICAL PATHOLOGY AND DIAGNOSIS

W II nd F R A Ad n myoepithe 1 m (Cylind ma) f the Pal tal M co Gl d A h F th Cb 945 39 96

Cld mas accoded the thrs rg ! f m th p f tal muco gl d m , be rem t ly similar to mix d tum rs and a ecs entially be nign but they a e capabl of undergo g mal g ant cha ges. The a th rs prefer t de ignate them as ade omyoop thelomas and consider them to b an

t ty in th ms les

Their conclusions are ha ed ui in the tudy 13 tumors class if d as adenocarcinomas in d atumors class if d as adenocarcinomas of the palate. The ecocytis form the basis of this stidy (1) the dedopment of the homogeneous stroma and its elationship to the pa enchyma (2) the de ivition of the parameter of the para

itoffm yer J Th III t I gleal Pict of B st Cancer aft r P pe ti Roentg n Irr di tion A Study f 50 Case Act d l St kh

A review of the previous lite ature n th s bj ct fb east cancer shows that pr p rati e irr d tion by the fractional method has p oved to be the best method f apply; g rad ation in the treatment f cancer of the b east

The a tho d scusses so cases which he te ted by this meth d in all of which a bit tological examinatio was m de after triatment. Phot micrographs fithe fidings in som if the cas sar gie. The total dos gevered for 1000 t. 4800 centigens

Details of the tech ique ar given

Macrosc pic minat afte i rad at on sho ed

th time I the cases the tumor had damp ared etrely in a site could hat by be felt on palpat in 56 there were vary. gd grees of deer as is a did 11 ther was not hage tall Mic pc amination dd n tshow the timpury a doest ct fine ca ce cell rann p liel who the doce es the se of the tumor. The cance lie — not completely divoyed any case. The ewe chowe cd that degenerating each give the size of the case cell much no access each go at the time pob ble.

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th teaner steril stion had been be gbt b t
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none of the cases did they const tute the majo it; of the degenerated cells. There as no tromar acting o only a slight one in 37 of the cases. In the 13 other cases there vas a medium o intener a tion. There were it, slight changes the blood vessels which is in the blood vessels which is the slight changes.

the cell
The a thoeges with Release that the rays
stimulate the nat 1 tendency of beast cancer
toward healing
At MEN G Moreo with MD

Mckibbin J P and McDon ld J R The Sig nificane f Polymorphonucl r Leucocyte fn G ii Bladde s S z y 945 17 3 9

The pes nee f polymorphonucl ar leucocytes in the wall f the gall hl dder hen examined microse pically s of init if an ind cation of flam mation whe it i not ass ciated with othe igns of inflammatin in and sh ild not be interested as a ch-

Thes polymo phonucl a leucocyte are erving a metabol c f ction rather than an i flammatory fu ct on when not a ocated vith other signs of inflammation

The rodized die us d in the proper two conting ographic vi ual zation of the gill bladder does not have any assert neath the polymen houcker l cotts in su gically remo ed specime

Bracletto Brl n D Th Origin and Devel pm n tal Cy l of the My lopl of B ne Turm a—B nign varity (On yet l t d l mulpl d l tm es d l hu—b gn) P md ft 944 3 2477

Th author h dan ppot nity to st d the much docu sdmy l plax fh gnbone tum runs veral specimen of schumors that w eff e fh mor hage and signs of egr ssion so the particulity elpet essere obtained. The htd pracip tures of the myeloxplax in the valous tag of development ar reproduced

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c are ad so d es and h lly pol os it kes place. Cells of diff ent stagges of maturity man fo d in the s m i m has press i man be to n a th t pecula to h glby fine accel ii Tuncti lly the my loplax cts a a ostoclast th m to the my loplax cts a a ostoclast th m to m ked din cal characte the fither t m rab i gostel s s I add ton th my I pla p lathly excretes an enzy m which by a shout

t b c me egul rly polyh d al The basich m t

pl bomb and me nd a es About two thirds of the collect in svan sh din the inflagration. The p intipublication is the H interin Orat in dailing with the ly light sty of the M se mand with plans fo its ristoration and future d light mutho desc beshow H intrins an intiput die collect in how he la rised to be a master in that I prop i in the ine ptop on and grewth of his collect in his mith did failte fo we k and how ke nor The destruction if the M e mp o vided an opportunity and the nees try for its er intruction and the Museum Committ has pe sinted apl in firthe fit e which has been a pited by the C until dither her in Trusteen.

Th Mu e m will be rebo n in circumstance of f nt f m thos which xisted when it first cam nto be night needed and that years go Then the we eno the museums devoted to nat my and path 1g, wheras now II medical ch Is have m seums S m of the civities possible ca don n the fill of natural history and olory, can better be instanced by other m units.

Broadly th conclusions of th Mus um Committe are that the museum hould be t ed and built up around the surviving Il ct us to like t at the dv I pment struct and fu ct us I m t gether with the accid nts and dis asset to he h h

mybe victim with such refe nc to than an impagina samp help to elucat the poblems brighted may be done of the first q est as the tild a bowt days of 1th suring H transpersations. Mit if the chind the time practions of the time that choe he libball cant ditting practions of the time that choe he libball cant ditting practices and the time of the time of

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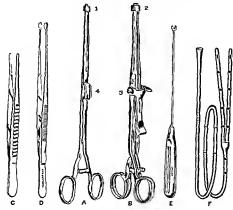
1 Method for the Surgical Obstruction of the Fallopian Tube Animal Lyperimen

tation Earl George Kreig M D Detroit Michigan

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## Instruments for Aseptic Gastric Resection BY OWEN H WANGENSTEEN MD FACS



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(C) WANGENSTLENSILS t H Id gF

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# **SURGERY**

# GYNECOLOGY AND OBSTETRICS

An International Magazine, Published Monthly

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SEPTEMBER 1945

NUMBER 3

# THE TALLACY OF SURGICAL GUT (CATGUT) TUBING FLUID AS A TISSUE IRRITANT

JOHN O BOWER MD FACS Philad lph Penn yl

T1 estimated that fully 80 per cent of surgeons in \text{ merica today use catigut exclusively as thirs suture maternal and while the remainder use silk, or some other nonabsorbable maternal they usually employ catgut whenever silk is contraindicated More over in wounds which are or may become contaminated catgut is the overwhelming choice with practically all surgeons

## TISSUE REACTION

The character of cell reaction against any suture where the patient's capacity to respond is within normal limits is identical an initial polymorphonuclear infiltration is followed by the presence of more mature mononuclear cell and then by fibroblasts. This cell reaction 1 imply an attempt to dissolve digest ab orb get rid of something which is not meant to be a part of the human body. The cellular reaction from the time the suture is embe lde l'until its complete disappearance varies little from the reaction of the protective mechani m when combating bacterial invaion. In the case of catgut the reaction i acute and al orption of the strand is rapid in the case of silk or cotton it i prolonged The initial attempts at removal of nonab

sorbable sutures are the same as with catgut but in the case of silk, the phagocytic cells are confronted with the problem of digesting one of the most resistant fibers. Unable to do otherwise they quarantine the undestrable strand in a capsule of fibroconnective tissue. To epitomize catgut strands plain or chromic silk or cotton twisted or braided all produce cell reactions which are similar in character in the first few days after being embedded in normal tissue. The degree of this reaction however varies with the re istance of the patient and the nature of the suture strand.

In 1940 I presented evidence (2) in the case of catgut which showed that regardless of anything else such as method of processing or the tubing fluid used the quantity of suture material is the chief cause of tissue reaction Gross and microscopic sections showing the imminial tissue reaction accompanting the embedding of fine size catgut as compared with the larger sizes were presented. The tremen dous increase in the use of the smaller sizes of catgut would seem to indicate that sur geons have proved this point to their own satisfaction.

## PURPOSE OF INVESTIGATION

Recently the attention of the surgical profes ion has been directed to the subject of tub

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ing fluid  $(4 \ 5 \ 6 \ 7)$  and the claim has been made that certain fluids are respon ible for the rather marked tissue reaction sometimes provoked by surgical gut sutures Not having encountered tissue reaction of the type de scribed my interest in sutures prompted a series of animal experiments to procure addi tional information on the subject of catgut tubing fluid and to establi h definitely the part that tubing fluid play in ti sue reaction

## MATERIALS

In the experimental work reported by Dun ham and Jenkins (4-6) it was stated that the amount of water insoluble hydrocarbon (hi flash solvent) present in alcoholic tubing fluid of most nonboilable surpical gut products has ranged from a trace up to as high as 10 per cent in some products while in one product it ranged from 6 to 14 per cent Through the co operation of one of the larger catgut manu facturers a series of nonboilable catgut su tures was prepared tubed in ethyl alcohol containing percentages of hi flash solvent ranging from o i per cent up through i per cent 2 5 per cent 4 per cent 10 per cent and 15 per cent

The suture material consi ted of medium chromic catgut size \o ooo which is rela tively small and therefore the possibility of tis ue reaction caused by a large amount of foreign protein was eliminated. Dunbam and Jenkins (4 6) u ed this size in their expert ments and further medium chromic catent was u ed in order to minimize tissue reaction caused by the suture material itself masmuch is Bates (1) has demonstrated that plain cat gut excites a greater exudative respon e in he tis ue than does medium chromic catgut

### SPECIES OF ANIMALS

Series I Fifteen rabbits and a similar num per of dogs were used. The rabbits were of nore than 4 pound average weight Dog were u ed also because their ti ue reaction o sutures and the anatomical structure of heir stomach closely resemble that of man In a dog weighin, 44 pound the stomach is similar in structure blood upply and acid content to that of man Vitamin metabolic and blood studies were conducted on the doss for a period of approximately 2 month at the end of which time the animal were divided into three groups

Group I This group wa composed of healthy does that had received a balanced diet with hemo-lobin content erythrocyte and leucocyte count blood chemi try vita min C content and kidney function within normal limits Their avera e wei ht was 2, pounds

Group 2 In this group vere do s with a re duced blood volume but still healthy average weight being 33 pound. They had received a balanced diet hemo lohin and vitamin C content erythrocyte and leucocyte count blood chemistry and Lidney function had been determined Anesthe ia was induced by the intraperitoneal injection of sodium pentobar bital The internal jugular vein was can nulized and enou h blood was removed to reduce the blood pre ure to 70 millimeters of This blood pressure was main tained for so minutes by the withdrawal when necessary of a sufficient amount of blood. A special colloidal solution of hemoglobin was then injected in sufficient quantity to bring the blood pressure to within prehemorrhage level and the studies made prior to operation were repeated. The animal were then per mitted to recover and at varying period of

time blood studies were repeated In some of these animal sutures were im planted within a few days after blood replace ment While they had recovered from shock their total hemo lobin as well as the red cell count was reduced the vitamin C content however was within normal limits. The results of the implantation of No coo chromic cat ut are shown in Figure 3 and 4

Group 3 In this group were do s in a state of malnutration Some had been operated on previously De pite the fact that an attempt wa made to improve their physical state their appetites were not good and they ha! continued to lo e wer ht which averaged o pounds at operation Their hemoglobin con tent erythrocyte and leucocyte count were ahout oper cent of normal and the vitamin C content had been reduced 25 per cent

The results of implantation of No ooo chromic sutures in the stomachs of these dogs





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are shown in Figures 1 and 2 Five day speci m as were selected because of the maximal ti suc reaction usually present at this time

## EXPERIMENTAL METHODS

Series 1 The rablits were anesthetized by intravenous sodium pentobarbital. Aseptic technique was used. Midvertical epigastric incisions were made. The sutures saturated with the tubing fluid were embedded beneath the sero a of the anterior gastric wall imme diately after removal from the glass tubes As a control I used medium chromic catgut sutures tubed in ethyl alcohol from which all trace of hi flash olvent was removed. The animals were sacrificed on the ath 10th and 20th days and blocks of tissue nere removed

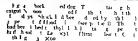
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Microscopic examination showed a minimal degree of tis ue reaction in all animals. The degree of tissue reaction produced by sutures



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which had been in tubing fluids containing varying degrees of hi flash solvent was no greater than that caused by the control su tures tubed in alcohol from which all trace of the olvent had been removed

Based on the results of these experiments at emmed as if some other factors not taken into con ideration much account for the difference in these results as compared with those re ported by Dunham and Jenkins (4 6) There fore it was decided to conduct a second series of experiments using a similar set of sutures

and tubing fluid

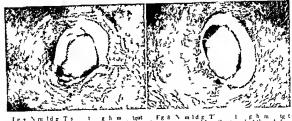
Series For this second eries of experiments however dogs were used exclusively for the reasons stated. Moreover in the experiments reported by Dunham and Jenkins dog were employed. In order to remove all possible factors which might account for the difference in results between their experiments and mine dog were elected on which vitamin metabolic and blood studies had been conducted so that each animal sphysical condition was known. Ether ane thesis was imployed. The abdomen of each animal was prepared by shaving and washin, with alcohol. Avente technique was used throw, hout

A midvertical episastric incision was made the edges of the incision were protected with sterile drape—and the dog's stomach was de livered. The sutures to be tested were placed

vertically beneath the serosa in the anterior gastric wall immediately after removal from the glass tubes so that the sutures were satu rated with the tubing fluid and expo ed to the air less than a minute Both end of the suture were marked with a single interrupted black silk suture The animals were given water at the end of 24 hours soft mash in moderate quantity at the end of 48 hour and regular diet after 72 hours The wound healed normally without exception. The animal were sacrificed on the ath 10th and 20th days and ections of the stomach vere removed for microscopic study \t autopsy the gross appearance of all the dogs stomachs was similar

#### DISCUSSION

Experimental work (2 3) reported in 1940 and 1942 gave an accurate estimate of the comparative degree of tissue react in f lib ing the embedding, of catgut strands of any glaracter and it proved the value of a study of the gross and micro-copic to whang It can be assumed that the mechan in designed to dipose of the forcum list (sature) yould off ences it yi r it attack the cx tenor coating which in thi instance would be the tubing fluid and that the d integrating action once logical would continue intil completed.



A raview of the microscopic changes ob served in the accompanying photomicograph shows that this actually occurs. Polymorphonuclear infiltration occurs first and is greatest in the 5 day specimen regardless of whether hi flash solvent was present in the tubing fluid—in fact it is greatest in those specimens containing the control sutures whose tubing fluid did not contain any hi flash olvent (Fig. 1).

In 10 day specimens the tissue reaction consistently less than in the 5 day specimens regardly si the amount of hi flash s lyent in the tulung fluid. In the 20 day specimen the tissue reaction was still less than in the 10 day specimens.

These results lend no tast whatever to the claim mate Is Dunham and Jenkins. The magnitude of tritiant action, which in some It lusts was rather excessive vas proportional to the am unt of water in oliuble hequid (in fla h-solvent) in the alcoholic tubing fluid. Valr adv. mentioned the true reaction was not related to the amount of hi flash solvent in the tubing fluid. In fact the minimal degre of the we reaction occurred with sutures tubed in ethyl alcohol which contained a high parcializer (in flash solvent (1 gr. 8).

If then the tubing fluid is not the cause of the intense to a reaction described by Dunham an I Jakin (46) what a fifthe tuling fluid has been absorbed and di posed of early than the only material remaining which could call out a leucecy tie re ponse of such intensity is the catgut strand it elf and the chemicals which were incorporated in it during the proessing

As previously mentioned whether it be catgut silk or cotton leucocytes attack, the suture and attempt to dispose of it as long as it remains in the body. I igures 1, and 16 show cross sections of size No o silk tubed in tylene which were removed from rabbits at the end of 14 days. The low poo er lens (X60) show absence of leucocytic infiltration at the purphety. This high power (X260) shows leucocytes surrounding the individual libers. Thus is further evidence that the strand itself and not the tubing fluid is the cause of the tissue raction.

The microscopic sections are presented in three group. Group 1 normal dog 10 day and 20 day. Group 2 convalescent partially examplemented dows—similar to patient op crated on in shock, that 1 cetopic pregnancy or bleeding disodenal ulcer 10 day and 0 day. Group 3 sorobute dogs 5 day and 10 day.

The first two groups of photomicrographs show very little difference in tissue reaction. The ti suce of most animal and thus includes man as well as the dog heal normally in the presence of a reduced blood volume. I hoto





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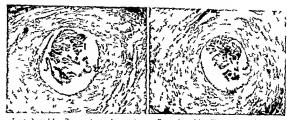
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micrographs of both to day and o day speci mens show this clearly the degree of tissue reaction and ab orption of the strand are almost identical. In the third group the scorbutic dogs the to day specimen showsvery little difference from that of the normal animal.

animal
The photomicrographs are presented with a
low magnification because examination of the
entire section is nece sary to draw any ac
curate conclusions

Ethyl and usprobyl alcohols. There is a very pertinent matter mentioned by Dunham and Jenkins (4) concerning the nature of the alcoholic tubing fluid. They reported that one manufal turers employ tubin fluid containing, isopropyl alcohol for nonbolable, surgeal gut while others use eithyl alcohol. It eemed important in this study to invest gate these two alcohols for use as tubin fluid. A third series of animal evigerments were carried out in which cotton sutures sterilized.

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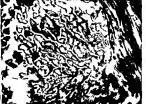
in each of these alcohol were used to deter mine the effect of each

Series 3 Fifteen rabbits were used. The iverace weight of the animal was over 41/ pounds Inesthesia was induced by intra Venou sodium pentobarbital \septic tech nique was used throughout. The sutures were embedied in the anterior abdominal wall be neath the sheath of the rectus muscles imme diately after removal from the tubes so that they were still saturated with the tubing fluid. The animal were sacrificed at intervals of r , and r days and microscopic studies of blocks of tissue showed that the degree of tissue reaction induced by the sutures tubed in isopropyl alcohol was at least twice as great as that produced by the sutures tubed in ethyl alcohol (Figs 11 and 12)

Valene tubing fluid Dunham and Jenkins (4) reported that vylene used as a tubing fluid for the bodable type of surgical gut is a potent tissue irritant and in some ti sues becomes a necrosing agent. They stated that if manufacturers are unable to provide an anhydrous liquid for boilable surgical gut which is harm less to tissues it would appear appropriate



the [1 ) X60



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to survest marketing boilable products with out any tubin, fluid. For the purpose of ompating its ue reactions produced by surgical gut tubed in vylene and surgical gut sealed in tubes without any tubing, fluid. I conducted a fourth eric of animal experiments. Vedum chromic catgot size. No covas used some of the sutures being tubed in vylene and sterilized after the unal manner of preparing boilable surgical gut while the remaining suture were placed in dry tubes the tubes sealed and sterilized.

Series 4 Thirty healthy rabbits whose average weight was over 41/ pounds were used for the tests. Anesthesia was induced by intravenous sodium pentobarbital and a eptic technique used throughout Midvertical epi gastric in isions were made and the sutures embedded beneath the gastric serosa. In one group of animal the sutures were embedded in the ti sues directly as they came from the glass tubes so that the sutures tubed in viene carried the anhydrous liquid directly into the tissues In the other group of animal the sutures were first immersed in warm sterile water before being embedded in the tissues so that the wlene on the surface of the strand was remo ed. This procedure allo served to soften the dry sterilized suture and thus les en ti sue trauma. The animal were ac rificed on the 1st 3d and 5th days and blocks of tis ue were removed for micro onic exam mation

1 tudy of the pecimens showed that in both groups of animal the deer e of tissue reaction as shown by polymorphomiclear in filtration vas from 20 per cent to 300 per cept greater around the sutures that were sterilized dry in the tube than around the sutures that were tubed in whene (Fins 13 and 14) The explanation of these results hes in the fact that when utures are sternbard dry a small quantity of a mixture of fat and fatty acid remains in the suture and acts a a tissue irritant. Howe er v ben the sutures are sterilized in vilene this hydrocarbon ex tracts the mixture of fat and fatty acid and the fatty extra t remain in the tubin, fluid in the tube from the eres of experiments it i clearly evident that vylene as a tubing fluid does not produce to ue irritation. Like

wise it i equally evident that it i not practical to market boilable surgical gut dry be cause of the exce two de rec of ti uc irritation induced by dry terribzed gut

To further inve to ate the pool il is irritant effect of vylene on the ti sucs. I conducted a

fifth series of animal experiments Series , Three rabbits each wei hin over 4/2 pound were und Tach was anestly tized by mean of intravenou sodium pentobarbital The abdomen vas shaved and prepared aseptically and a midvertical epi gastric incision was made. To the stomach with attached omentum and the contiguen small and large intestines pure tylene na liberally applied by means of sterile cotte The incision was then closed. The animal were sacrificed on the 3d postopera tive day All 3 showed complete ab ence of tissue irritation—there was no free peritoneal fluid no dilatation of the superficial vessel no adhesions The accompanying reproduc tion in colors vas made from a photo rath taken after the autonsy

#### CONCLUSIONS

1 The animal experiments herein reported Senes 1 and 2 demonstrate that nonbollable cateut tubing fluid con 1 ting of 9, per centably lachol containing arrious percentages of in flash solvent, does not produce excessive

tis we reaction (Fig. 2.4.6.7.8).
2. Re. rdle, so of whether or not hislash solvent vas present in the tubing fluid tissue reaction is mo t marked in the day spect means. In fact the reaction is greatest in those specimens containin control suture the tubing fluid of viach did not contain hislash olvent (Fig. 1 and 2).

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4 In Series 3 it has been shown that the de rec of it sue reaction induced by catgut suture tubed in isopropyl alcohol at last twice as great as that produced by sutures tubed in ethal alcohol (1 i s in and iz) 5 Series 4 demonstrates that the degree of tissue reaction around eatgut sutures that

tissue reaction around catgut sutures that were sternized for in the tubes (without any tubing fluid) was from 30 per cent to 300 per cent greater than that around sutures tubed in yelne. Not only do these experiments show that it is not practical to market catgut dry in the tubes without tubing fluid but also the fact that xylene as a tubing fluid does not

tact that xylene as a tubing fluid does not produce tissue irritation (Figs. 13 and 14).

6 Conclusive evidence of the rapid absorbability and lack of irritating action of xylene when brought in contact with normal

animal tissue is presented in Series 5 of these cyperments. A photograph in colors of the abdominal viscera of a rabbit 3 days after vilene had been liberally applied to the peritoneal surface of the stomach and the in

testines here reproduced shows entire abence of tissue irritation—no free pentoneal fluid no dilatation of superficial vessels no adhesions

7 The results of these animal experiments demonstrate the fallacy of the claims (4 6) that catgut tubing fluids containing hi flash solvent ethyl alcohol or xylene produce excessive tissue irritation

#### RFIERENCES

## THECA CELL TUMORS OF THE OVARY

## A Clinical and Pathologic Study of Twenty Three Cases (Including Thirteen New Cases) with a Review

EDWARD A BANNER M D d MALCOLM B DOCKERTY M D R heste M e of

URING the decade that has elapsed since Loeffler and Pric el (16 17) gave the first accurate description of the ovarian neonlasm now var tously known as thecoma or theca cell tumor many examples of this gynecologic newcomer have been added to the medical literature ( -6 10 14 10 20) From the many excellent reviews on the subject the following observations seem pertinent (1) Theca cell tumor of the ovary is an established entity (2) The tumor often produces estro\_en sometimes in amounts capable of influencing profoundly the phy jologic processes of its host (3) The tumor probably derives its origin from certain plumpotential mesenchymal cells of the ovar ian cortex and is related on the one hand to the histologically mature fibroma and on the other to the comparatively dedifferentiated granulosa cell neoplasm Controversy still exists however in regard to certain clinical pathologic and physiologic aspects of the tumor and further stati tical data are neces sary to elucidate some of the e issues. In the present report we hope to furnish some of these data in an analysis of 23 case of theca cell tumor seen and studied at the Mayo Clinic between the year 1910 and 1944 inclusive Ten of these cases have been previously reported by one of us (Do kerty 5) but these cases have been re examined in the light of recent observations in staining reactions and of chemical assays of lipoid sub tance as ap plied to theca cell tumors of the ovary

HISTORICAL DATA Inasmuch as all major articles dealing with the subject of theca cell tumors have devoted considerable attention to historical aspects we wish to treat the phase of the subject in the light of more recent advances only Ger t and Spielman in 1935 (11) using an extract of tumor tissue confirmed the clinical observation of Melnick and Kanter (10) that theca cell tumors sometimes contain estro enic substance in considerable amounts. Others have confirmed this observation and Traut and Butterworth (4) expressed the opinion that even though the amount of estrogenic hor mone mu ht be small its effect on the endo metrium and on the breast might well be maximal because of an unopposed hormonal action masmuch as ab ence of corpora lutea and presumably of progesterone has been constantly observed among patients suffering from the effects of theca cell tumors. More or less periodic postmenopausal bleeding in old women who had these neoplasms and the as sociation ob erved at patholo ic examination of proliferative or polypoid endometrium and fibromuomas were adduced as stron, sup portive evidence for hyperestrinism larly interpreted was the occurrence of oh o menorrhea or amenorrhea observed in occa sional cases in which thera cell tumors affected voun er women. Even more su gestive was the evidence cited by Air hbaum and others (5 9 23) that theca cell tumor like its clo c the granulosa cell neoplasm is sometime associated with endometrial carci

Although theca cell tumors were originally considered as luteinized fibromas-(xanthofi bromas (16) and later as arising from mature theca cell of the ovarian follicle ( ) most myestigators now feel with Fischel that these tumors spring from ovarian cortical meson chyma This hypothesi has had po itive sup port in the experimental work of Furth and Butterworth and of Get t Gaines and I ollack (12) who throu h the employment of roent cen rays were able in mice to produce both granulesa cell and theca cell tumors of the ovary Both types appeared to have mesen chyma as their tissue of origin. The work ex plained among other thing the strange mi croscopic picture of certain tumors described by various investigators who noted what scemed to be an admirature of granulosa cell and there cell elements in the same tumor Novak ( 1 22) went so far as to state that no distinction should be made between the two types and he suggested the term feminizing me-enchymoma to designate both much however as granulosa cell tumor some times occurs among children whereas no the ca cell neoplasm has been described as occur ring in the first decade of life mo t investiga tors favor supporting the concept that the two tumors are distinct entities

In matters of differential diagnosi by his tologic methods techniques employing the principle of silver impregnation have high lighted recent developments According to Wolfe and Neirus (25) formation of reticulum by the theca cell is an important di tingui h ing feature since granulosa cell tumors appar ently do not elaborate this substance. Others have reported results which are at variance with these observations and have turned for the solution of the problem to chemical and hi tochemical methods for determination of lipoid fractions of the tumor in question Greenblatt Greenhill and Brown (13) found that qualitative and quantitative assay of theca cell timors yielded values for hooid sub stances which were different from the corre ponling values for these sub tances when studied from such tumors as granulosa cell neo plasm dy germinoma Krukenberg tumors and ovarian i broma. This recent phase of the problem need further investigation

#### MATERIAL AND METHODS

The material for the present tudy was sell ted from a group of more than 600 solid and semi-olid ovarian tumors seen in the division



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of surgical pathology and the section on pathologic anatomy of the May of Unitic between the years 1910 and 1944 inclusive. Mi of the material used in the study had been preserved in a 10 per cent solution of formalin (4 per cent formaldehyde)

The method of approach consisted es en tially of a sorting out process chiefly con cerned in the beginning with certain neo plasms which had been labeled fibromas (7) Whenever any tumor was encountered which grossly or microscopically recembled the the ca cell type this neoplasm was con idered as a potential candidate for inclusion in the study and was further investigated. Thi special treatment consi ted in a thorough review of the gros specimen with special reference to the shape size wer ht color and consistency of the ovarian tumor and in examination of the contralateral ovary for signs of cessation of function as evidenced by absence of folli cles and of corpora lutea presence of atrophy with fibro is and so forth. In those cases in which hysterectomy had also been performed careful notations were made as to the weight of the uterus the thickness of the myoric trum the presence or absence of myomas the thicknes of the endometrium and finally the results of careful search for evidence of endo metrial carcinoma. Multiple blocks of ti sue were cut in each instance from the ovarian

## THECA CELL TUMORS OF THE OVARY

A Chincal and Pathologic Study of Twenty Three Caes (Including Thirteen New Cases) with a Review

FDWARD A BANNER MID d MALCOLM B DOCKERTY M D Roch to M of t

URING the decade that has clansed since Loefiler and Iriesel (16 17) gave the first accurate description of the ovarian neoplasm now var iously known as thecoma or theca cell tumor many examples of the gynecolo ic newcomer have been added to the medical literature (2-6 10 14 19 20) From the many excellent reviews on the subject the following ob ervations seem pertinent (1) Theca cell tumor of the ovary 1 an establi hed entity tumor often produces estrogen sometimes in amounts capable of influencing profoundly the physiologic processes of its host (3) The tumor probably derives its origin from certain pluripotential mesenchymal cell of the ovar ian cortex and i related on the one hand to the histologically mature fibroma and on the other to the comparatively dedifferentiated granulosa cell neonlasm Controversy still exists however in regard to certain clinical nathologic and physiologic aspects of the tumor and further statistical data are nece sary to elucidate some of these I sues In the pre ent report we hope to furnish some of these data in an analysi of 23 cases of theca cell tumor cen and studied at the Mayo Clinic between the years 1910 and 1944 mclusive Ten of these cases have been previously re ported by one of us (Dockerty 5) but these cases have been re-examined in the light of recent observations in staining reaction and of chemical assays of lipoid substance as apphed to theca cell tumors of the ovary

#### HISTORICAL DATA

Inasmuch as all major articles dealin with the subject of theca cell tumors have d vote l con iderable attention to hi torical a jacts we will to treat the phase of the subject in the h ht of more recent advances only Cut and Spielman in 1935 (11) using an extract of tumor tessue confirmed the clinical ob ervation of Velnick and Kanter (19) that theca cell tumors sometimes contain estro unic substance in consi leral le amounts. Others have confirmed the observation and Traut and Butterworth (24) expressed the opinion that even though the amount of estrog nic hor mone might be small its effect on the endo metrium and on the breast mi ht well be maximal because of an unopposed hormonal action masmuch as absence of corpora lutea and pre umably of pro esterone has been constantly observed among rationts suffering from the effects of theca cell tumor. More or less periodic postmenopausal bleeding in old women who had these neoplasm and the as sociation observe lat nathologic examination of proliferative or polypoid endometrium and fibromyomas were adduced a strong supportive evidence for hyperestrinism larly interpreted was the occurrence of oh o menorrhea or amenorrhea observed in occa sional cases in which theca cell tum r affected youn er women. Even more suggestive wa the evidence cited by Kirshbaum and ther (5 0 23) that theca cell tumor like its cl se relative the granul sa cell neopla m is sometime associated with end metrial arci

Although theca cell tumors were remails considered as luteinized fibr mas-(ranth fi bromas ( 6) and later as art in fr m mature theca cell of the ovarian follicles (1) m t investi ators now feel with Fischel that these

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tumors spring from ovarian cortical mesen chyma This hypothesis has had positive sun port in the experimental work of Furth and Butterworth and of Geist Gaines and Pollack (12) who through the employment of roent gen rays were able in mice to produce both granulosa cell and theca cell tumors of the ovary Both types appeared to have mesen chyma as their tissue of ori in This work ex plained among other things the strange mi croscopic picture of certain tumors described by various investigators who noted what scemed to be an admixture of granulosa cell and theca cell elements in the same tumor Novah ( 1 22) went so far as to state that no distinction should be made between the two types and he suggested the term feminizing mesenchymoma to designate both much however as granulosa cell tumor some times occurs among children whereas no the ea cell neoplasm has been described as occur ring in the first decade of life most investiga tors favor supporting the concept that the two tumors are di tinct entities

In matters of differential diagnosis by hi tologic methods techniques employing the principle of silver impregnation have high h hted recent developments. According to Wolfe and Neigu (25) formation of reticulum by the theca cell is an important distinguish ing feature since granulosa cell tumors appar ently do not elaborate this substance. Others have reported results which are at variance with these observations and have turned for the solution of the problem to chemical and histochemical methods for determination of lipoid fractions of the tumors in question (reenblatt Greenhill and Brown (13) found that qualitative and quantitative assay of theca cell tumors yielded values for hooid sub stances which were different from the corre sponding values for these substances when studied from such tumors as granulo a cell neo pla m dy germinoma krukenberg's tumors and ovarian fibroma 1 his recent phase of the I rol lem needs further investigation

#### MATERIAL AND METHODS

The material for the present study was se lected from a group of more than 600 solid and a misolid ovarian tumors een in the division



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of surgical pathology and the section on pathologic anatomy of the Majo Clinic between the years 1970 and 1944 inclusive. All of the material used in the study had been preserved in a 10 per cent solution of formalin (4 per cent formaldehyde).

The method of approach consisted essen tially of a sorting out process chiefly con cerned in the beginning with certain neo plasms which had been labeled fibromas (7) Whenever any tumor was encountered which grossly or microscopically resembled the the ca cell type this neoplasm was considered as a potential candidate for inclusion in the study and was further investigated. This special treatment consisted in a thorough review of the gross specimen with special reference to the shape size weight color and consistency of the ovarian tumor and in examination of the contralateral ovary for signs of cessation of function as evidenced by absence of follo cles and of corpora lutea presence of atrophy with fibrosis and so forth. In those cases in which hysterectomy had all o been performed careful notations were made as to the weight of the uterus the thickness of the myome trium the presence or absence of myomas the thickness of the endometrium and finally the results of careful search for evidence of endo metrial carcinoma. Multiple blocks of ti suc were cut in each instance from the ovarian



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tumor the contralateral ovary and the endo metrium. These blocks were transferred to bottles containing a fresh to per cent solution of formalin sectioned both by the freezing and by the parafin method and stamed routinely with hematoxy lin and cosin with sudan III and all o with various reticulum stains the principle of impregnation with silver being used. In all 23 cases seemed to satisfy the histologic criteria necessary for a diagnosis of these cell timer.

In 8 of the 23 ca es mentioned weighed amounts of tumor it sue were sent to the division of biochemistry where analyses were carried out on the various lipid fractions (Table I) By way of control (Table II) 7 normal ovaries vere similarly analyzed chemically after careful removal by dissection of all gross luteal tissue which if included might nullify the value of the comparison by its high content of lipid

Unfortunatel) we did not encounter during, the course of the study any patients for whom a diagnosis of theca cell tumor had been made properatively. Consequently we were unable to perform any preoperative determinations for e trogen on the urine of patients v ho had this type of tumor. In one instance however postoperative studies of estrogen were made on the urine as well as on the fresh tumor ti sue of a patient from whom a theca cell tumor had been removed

Clinical record of these patients were the secured and studied for pertnernt data especially as regard mensitival irregularities of the younger patients and postmenopausal bleeding in the older group. These data were carefully recorded. The following langraphs deal in somewhat abbrevated form with our findings in 3 cases of theca cell tumor of the ovary.

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#### CLINICAL OBSERVATIONS

Incidence In our series theca cell tumor ap peared to be relatively rare. It comprised about 3 per cent of the group of said ovarian tumors was about a third as common as granulosa cell tumor and was less than a tenth as common as ovarian fibroma.

Age 'The average age of patients who had theca cell tumors was about 54 years Satty five per cent of the patients were 30 years of age or older Extremes of 80 and 6 years were noted in the literature theca cell tumors have not been reported as occurring prior to the age of puberty

Parity Pregnancy had occurred at least

once in 80 per cent of the patients

Symptoms Irregular vaginal bleeding of

the postmenopausal type or gross menstrual irregularities of younger patients existed in more than 60 per cent of the reviewed cases Of 6 patunts less than 45 years of age 2 had experienced aminorthea of 41/2 months and I year respectively one had experienced menometrorrhagia for a months while the remaining three had not noted any change in their menstrual rhythm Of 12 patients 55 years of age or older 8 had complained of postmenopausal spotting for periods varying from 10 days to 10 years. No menstrual aberrations had been recorded in 4 cases I ostmenopausal bleeding was noted in the records of 2 of the remaining 5 patients of menopausal age In 3 cases it was impos sible to ascertain whether or not the theca cell tumor had produced early amenorrhea or a delay in the onset of the climacterium. In only 1 case of the entire proup did the post menopausal bleeding assume the regularity of rhythm resembling normal menstruation

The data in this case were briefly as follows

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TABLE I -CREMICAL COMPOSITION OF THECA CELL TUMORS

End m rul pense	Cb 1 a- ter 1	De CF	Le b pe	F t y ds	T tal 1 Pids Pe
Ad notar in	8			50	33
Hyperplas K ys (prol.! )		6		6	36
Ttype pl cy		6	77	6	6
Inff	7	4	_6	4	
Ad nocarcine m	1		8		7
A roph				_	6
ban		1-3	5	1	3
237	-	=	-		

The bled og occu red once a month lasted from y to y da s and was accompanied by moderate degree of discomfort n the lot or part of the abdomen. The patient stated that between per of. she felt stronger than she had felt for years and that she could princ pat in activities which up to this time of life she had further of the sheet life.

Physical examination t the clinic revealed a m n very well preserved for 50 years of age. The ess nital find, go otherwis consisted of the p. sence of an egg si ed tumor in the left adnexal region and an unlarged uterus containing several nod ies be

i e ed to be fibromyomas

Preliminary d laint in and cur thage we done in the tecnoval of a large amount fendom tri in Micr c pically this presented the nictu of meed polific tive and sec tory phases of the mest all cycle along with mode atecystic change. The utility is that the and both o arise were subsequently emo elb cause fa solid yellow to turn run. Fing the tight owary and uterne fibromy om sect as made at the time of operation evealed the ova an uter to be of the theat cell tipe and accord algipty post per tile studies for est ogen ere carred at

TABLE II —CHEMICAL COMPOSITION OF THE VORMAL OVARY

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3	3	Trac	3.9	38	
	8	Trac		00	8
		Trac	3		38
		Trac	300		47
69		T	56		3
33	36	3	4-3	,	4-43
3		Trac	36	70	

### TABLE III.-CASES OF THECA CELL TUMOR PERTINENT DATA

7					~		TIVE VI DALL	
Case	) is	P ty	M com 1	Dur to	54	5'20	Myom rium	Eadome um
		Framipara	Pain rt.lowe bdomnal quadra Dvam norrhe	Syn S m.	Rugh	Sem dam	The ned Fhro-	Prol f ra ve
	s	T para	Blood vagmal discharge regula ( yra pos - m nopausal)	)TR	Righ	fus cm	F bromyomas presen	ProLiera ve cys
	60	Sep para	Bloody we had discharge ( yes poster nopausal)	pr.	Let	6 535 m ( pm)	F bromyomas prese	Polyport, miler-
	6	T park	ln rm: vagpalbleed in ( yrs pos m nopausal)	<b>3</b> 71L	Righ	#143 cm	Tack d	Af not respons (d fuse) I fundus
	3	Kullipera	31 nometrombagas	Mos.	Ruch	3 000	Th i of Flore- myomas itse	Ea 1 secretary
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8		Nullipara (Se tigravida)	Falling   mb (20 yrs postm pausal)	0+ yrs	ы	AUTI CIT.	This dimused	P Import rol
	_	hulbpara	P in tumo	"	8. 5	35 cm	Personal Per	100
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		T para	Am norrhea. Abdominal	phos.	Rugh	\$16 m	Tt t 1	Laplinam
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7	80	Quadripara	A topsy finding		Righ	em dum	Th k d	Ad our thma! rearmthmeture
	26	Primipara	Am so bes	yt	Righ	4x3 em	71⊌k d	tris   gnance oo horectom f um
	0	Null para	Va. al bleeding ( yrs postm pausal)	days	Lei	Sris W	The d F bro-	llype rophs prol
20	6	Quadripara	Abdominal pains (6 yes poster nopemal)	B	Lef	6 cm diam	Fb m omas prese	P lypoid, no fer ve ys
		ulbpers	Vaginal bleedin	yτ	Le!	ari co	\ mal	` vailabl
		all para	Duil we becomed pain, in rim to	y:	Rz 5	रक्ष वे व	Fi) m mas	La arc tory pr
3	6	\ lipara ?	Vagual bleeding	yr .	Left	ax cou	F brom mas	Ad ocurs anade (

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Among the other 22 patients outside of the aforementioned symptoms there were no other

nplaints that were not compatible with the sence of any slowly growing pelvic tumor wever a triad of symptoms namely instruit disturbances pelvic pain and pel tumor were observed to occur fairly instantly (Table III) Semperadic post nopausal bleding appeared to be the only sonably specific symptom from a clinical indoont

Positive findings on physical examination re limited for the most part to the demon ation of a firm adnexal tumor and the fre ent association of uterine leiomy omas or of enlarged uterus. In a case a cervacal carca ma was visualized on speculum examination d in 2 cases carcinoma of the fundus was spected on the basis of a clinical history of evular postmenopausal bleeding combined th the finding on bimanual pelvicexamina n of a boggy uterus. In one case the esence of a citic fluid was ascertained clin illy No mammary hypertrophy of notable gree was observed in any of the cases in our udy

#### PATHOLOGIC DATA

Side The right ovary was the seat of the mor in 15 and the left in 8 cases. No in nace of bilateral tumor was encountered in its series.

Sie The largest tumor measured 12 centiters in its greatest diameter and the small it 3 millimeters. The average diameter was jout 6 centimeters the actual size of the imor bearing no apparent direct relation to be degree of clinical function as measured, the duration or the severity of associated the trial disturbances.

en frual disturbances
Color consistency and so forth The color of the
imors varied considerably. The outer aspect
sually smooth and often bosselated pre
inted tints ranging from brownish gray or
ven parily to a dull orange yellow. This latter
olor was nearly always apparent somewhere
in cut section of the tumor. The consistency

ven plany to a dull orange yellow. This latter to olor was nearly always apparent somewhere next section of the tumor. The consistency as in general firm but rubbery rather than ensely hard and melastic. Degenerative entral cysts were present in several of the tirger tumors and these cysts appeared to rise through chronic infarction and edema as re ult of twisting of the pedicel of the tumor re ultiff twisting of the pedicel of the tumor.

Residual ovarian tissue could be found in the capsules of all but the larger neoplasms A smooth glistening capsule invested all but two of the tumors and these two appeared to be fixed by adhesions to neighboring structures. Ascites was produced by one large theca cell tumor and its presence was interpreted in the light of weeping edema as postulated for similar findings associated with ovarian fibroma (7). No examples of Meigs's syndrome were encountered.

Microscopic features The histologic features of theca cell tumor as seen in frozen and par affin sections stained with hematoxylin and eosin are well known and in our typical cases there was nothing new to add. In 4 cases examination of the tumor while for the most part revealing ordinary theca cells demon strated in many areas the cytologic character istics and cellular arrangement of granulosa cell neoplasm. One of these has been illus trated in a previous article by one of us (Dockerty 5) In these preparations em ployment of the principle of silver impregna tion for the demonstration of reticulum fibrils revealed the presence of these fibrils (Fig. 1) around the theca cells but usually not around the granulosal elements. We were not entirely convenced that the method could be solely de pended on as the basis for the differential diagnosis between granulosa cell tumor and theca cell tumor in doubtful cases Stains for intracellular and extracellular lipoid substance were interpreted as giving positive results in all the tumors in the series (Fig 2) Differ ential staining for the various lipoid fractions as suggested by Wolfe and Neigus was tried but the results were difficult of interpretation Results of chemical analysis for tumor lipoids are discussed and tabulated in subsequent sections

Controlateral overy The controlateral overy was available for study in the 2 cases in which accropsy was performed and in 19 of the 21 cases in which operation bad been per formed. Of these 21 ovarits 20 were some what atrophic and 1 was the seat of a bining multilocular cystadenoma. In the 2 instances in which the surgeon preserved one ovary no special notes were made with reference to its condition. Mature or developing corpora lu

tea were not observed in any instance. How ever this was perhaps not surprising mas much as many of the patients had already passed the menopause.

Condition of the uterus The uterus was available for study in 21 of the 23 cases Con ceding that 100 grams represent the average weight of a premenopausal and 80 grams that of a postmenopausal uterus we can state that in 2 instances the uterus was considerably en larged as a result of my ohypertrophy (190 grams in a patient who was 70 years of age) In ao additional 6 cases there were myohypertrophy and single or multiple fibromyomas Io 7 other cases fibromy omas so distorted the uter us that no conclusion could be drawn as to the presence or absence of myohypertrophy En largement of the uterus associated with en dometrial carcinoma was observed three times an essentially normal size was seen twice and true atrophy noted in one instance Since myohypertrophy and uterine leiomyo mas can be experimentally produced in any mals by the use of estrogenic stimulation the foregoing observations would lend some support to the thesis that at least some of our theca cell tumors were elaborating estrogeoic hormone

The endometrium in these 21 cases pre ted the following features of interest In 14 ses the endometrial lining was grossly thick er than normal and in 12 cases microscopic examination revealed the picture of early or late proliferative phase of the menstrual cycle usually with addition of cystic change (In 2 cases the endometrium showed the picture of secretory change ) Eight of the 14 patients were in the postmenopausal age group (Al though it is well known that normally the endometrium does not become atrophic im mediately after the chinical cessation of menses we take the finding of such thick en dometrial lining in some of our patients who were more than 60 years of are as fair evidence of estrogenic stimulation) One patient had adenocarcinoma grade (Broders method) of the cervix and atrophic endometrium Two other postmenopausal patients one with no history of bleeding also presented the picture of endometrial atrophy Concomitant uterine carcinoma was found in 4 cases of theca cell

tumor an addition to the one cited in the fore going Io 1 of these caves the tumor was adenacanthoma grade 2—Broders (Fi 3) of the cervix (Case 17) which produced death from widespread metastass. In the 3 remains cases there was adenocarcinoma of the uterine fundus without evidence of metastass at the time of operation (Fig 4) Thus 22 per cent of our patients with theca cell tumor had associated carcinoma of the uterus. Since the

complication was not encountered in any patient less than 30 years of are the medence of the association was 33 per cent for the group of older women. The carcino,enic influence of estim is accordingly to be at least considered in these cases in which uterine maliemant lessons are present (Table III).

#### CHEMICAL STUDIES

In the differential diagnosis between granulosa cell tumor theca cell tumor fibroma and so forth Greenblatt Greenhill and Brown have employed chemical analysis of vanous lipodi fractions of tumor tissue. These authors expressed the opinion that functioning tumors such as granulosa cell and theca cell neplasms contain more phospholipid and choice terol than do the nonfunctioning tumors such as for example fibroma. They further expressed the belief that theca cell tumors contain more choicesterol than is found in granu

losa cell tumors In the present series the chemical analyses suggested hy Greenhlatt Greenhill and Brown were carried out on portions of theca cell tumors not selected at random but chosee from cases which presented varied endometrial pictures (Table I) Also by way of comparison along a line not hitherto ap proached similar analyses were carried out on portions of presumably normal ovaries re moved for various reasons in the course of pelvic operations. These ovaries were selected from patients of different age groups The sections were taken from portions of the ovaries in which no old or recent corpora lutea were present and for the most part

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represented ovarian cortical stromal tissues (Table II)

Results of both these chemical analyses were somewhat disappointing masmuch as they did not show any striking correlation to exist between tumors having similar histologic structures and presumably similar embryo logic backgrounds In general the total lipid content of the tumors was found to be moder ately elevated above that of normal ovaries (if we except the one specimen of the latter which contained 4.43 per cent of hpid sub stance) Individual values for lecithin and fatty acids did not appear to have differential significance However cholesterol and choles terol esters were present in definitely in creased amounts as compared with the normal ovarian stroma with phospholipid levels some what lower

#### FOLLOW UP STUDIES ON PATIENTS

Adequate follow up studies were made on 20 traced patients. There was in this group no instance in which the patient had died as a result of a malignant process beginning in a theca cell tumor One patient died as a result of generalized metastasis from a cervical car cinoma as previously noted. Five additional patients died from causes apparently unre lated to their ovarian tumors 0 12 5 4 and a year postoperatively. In one case a small theca cell tumor was observed inciden tally at necropsy. Thirteen patients were hving at the time of follow up and had been well for postoperative periods varying from 6 months to 33 years Surgical treatment in cases of theca cell tumor need be directed along radical lines only because of associated lesions that is uterine fibromyomas and en dometrial carcinoma and not because of any malignant potentialities inherent in the theca cell tumor itself. Since however the incidence of associated uterine carcinoma is so bigh among postmenopausal patients who have theca cell tumors we believe that hyster ectomy and bilateral salpingo-oophorectomy is the operation of choice in the case of older patients who have theca cell tumors of the Similarly it would seem from this study that postoperative roentgen therapy is indicated only in those cases in which carcino

ma involves the cervix or the fundus of the

#### SUMMARY

Data on 23 cases of theca cell tumor are presented with a correlation of clinical patho logic and chemical data. These tumors ap pear to be derived from the ovarian mesen chyma and are closely related to the granu losa cell group of tumors Occasionally the re lation may be a histologic one with elements of both types discernible within the same neo plasm Usually however both tumors pre sent purity of type The relatively high incidence especially in postmenopausal pa tients of associated myometrial hypertrophy and uterine fibromy omas combined frequent ly with endometrial hyperplasia and cervical and fundal carcinoma suggests the production by the ovarian tumors of estrogenic hormone Inability to demonstrate measurable quanti ties of this hormone through assays of tumor tissue is perhaps not to be regarded as con clusive evidence of absence of the hormone A chemical analysis of 8 theca cell tumors gave evidence that these tumors contained in creased amounts of cholesterol and cholesterol ester fractions as compared with the values for these substances found present in 7 normal ovaries

Although the tumors did not invariably produce clear out clinical symptoms their presence could often be suspected by an alter ation in the mensirual habits of the patient. Postmenopausal bleeding from a hypertrophic endometrium was commonly encountered in these patients.

Histologically in spite of the employment of new stains we found difficulty in dis tinguishing certain fatty fibromas from theca cell tumor. In such doubtful cases examina tion of the endometrium was often of value

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# THE RATIONALE OF CALCIUM PHOSPHORUS AND VITAMIN D THERAPY IN CLINICAL HYPERTHYROIDISM

I DARIN PUPPEL, M.D. FACS HAROLD T GROSS M.D. E. K. McCORMICK, M.S.

IHE exact mechanism of action of call cum and its consequent therapeutic indications in hyperthyroidism are as yet not fully understood even though its use has been recommended for years by several experienced clinicians including Theo dor kocher. In fact certain investigators (26-27) have expressed doubt that added calcium would be beneficial in counteracting the negative calcium balance of this disease at though their investigations had not extended this far.

Our knowledge concerning the influence of calcium administration on hyperthyroidism is as yet meager and at tunes confusing. In the treatment of any disorder it is advantageous to understand the physiological and patholog ical background of the disease for which the therapeutic agent is used. Wherever possible rational drug therap; should be based upon a correlation of the pharmacodynamic action of the drug with the pathological physiology of the disease. With these basic ideas in mind it seemed essential from a therapeutic standpoint to determine whether a positive calcium balance could be maintained on a high calcium intake We therefore present ob servations concerning the effects of calcium therapy on the calcium metabolism of hyper thyroidism

#### GROSS DISTURBANCES OF CALCIUM METABOLISM IN HYPERTHYROIDISM

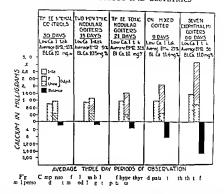
The gross disturbances of calcium metabo lism which exist in byperthyroidism may be easily understood by study of the composite Frures 1 and 2 together with Table I. They usually consist principally of an increased excretion of calcium through both the gastro intestinal and urinary systems (Fig. 1) The Trom is Druttmet (Resert Surgry of 8 On 5 t

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blood calcium usually remains within normal lumits (Fig. 1) It is rarely slightly increased and almost never slightly decreased beyond the range of normal (56 66) The blood phos phorus is almost invariably within normal range Only on one determination in one pa tient did we find it increased beyond the range of normal Never has it been decreased The blood phosphatase is usually slightly increased These abnormal findings differ greatly from those in hyperparathyroidism in which the increased excretion occurs almost quantita tively through the urine (Fig 2) while the blood calcium phosphorus and phosphatase levels are usually greatly disturbed (Fig 2) These abnormalities lead to definite differ eoces in the clinical manifestations of the dis turbed calcium metabolism in these two diease entities which may be of definite thera peutic significance as will soon be pointed out The loss of calcium of the usual patient with exophthalmic goiter (10) is often much greater than that of the usual hyperparathyroid pa tient on a low calcium diet (Fig 2) thus em phasizing the grave calcium depletion which may occur in hyperthyroidism. There is a lower level of increased excretion of calcium in toxic nodular goiter as compared to that of exophthalmic goiter (Fig 1) This difference m excretion in the two types of goiter occurs even when the basal metabolic rates are at the same increased level as shown by patients presented in another communication (66) and by other patients with higher levels of basal metabolism (Fig 3) However the state of the calcium balance is not wholly independent of the degree of hyperthyroidism. In patients with nontoxic nodular goiter the calcium me tabolism remains normal (Fig. 1)

Disturbances of the calcium metabolism vary greatly. They are usually temporary preventable and reversible in character. They can easily be controlled by ingestion or paren.



teral admun tration of extra amounts of cal cium as will be seen presenti. Ingestion of milk, with its high calcium content leads to calcium retention (Fie 10). The state of the calcium balance in hyperthyroidism is de pendent to a great extent therefore on the actual calcium content of the diet. If sodime administration returns the basal metabolic rate toward normal one may expect a decrease in the calcium exerction (66). Parenteral administration of calcium (Fig. 10) thyroidec tomy (66) or thouracil (71) may also produce a positive balance.

Various experimental and clinical demon strations of gross disturbances of calcium and phosphorus metabolism in hyperthyroidism have also been made Falta Bolaffio and Tedesco (1909) were among the first to report the effect of the thyroid gland on mineral metabolism They found that thyroid feeding increased phosphorus elimination A most remarkable study was made in 1910 by Dr Caroline Towles in association with Dr L F Barker of the Johns Hopkins Hospital She studied the calcium balance of three women with exophthalmic goiter one of whom was pregnant She concluded that the calcium metabolism of Basedow's disease shows no special peculiarity it runs parallel with the nitrogen balance and in those periods of the disease in which there is loss of nitrogen there is also a loss of calcium She showed that the calcium balance may be made to be posi

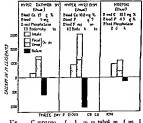


Fig. C mpanso f 1 mm tabol m f us I ophthalms g t pats t thith t f 1 hyperpa thyrod patient and the sual small perso

TABLE I —COMEARISON OF CALCIUM BALANCE OF HAPPERTHAROID LATIENTS WITH

_ = ====	mbe	T 1d	Α	A ge	1 3	d pe e	d T	pr 3 d y	t geb 1
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l od i	3	1	+3	1	3.5	7		14	- 383
M 1		1	+	4	43	58		- 09	- 9
E. h. Salm		60	+6		48	,	3 36	5.7	- 794

tive with a sufficient intake from milk or cal cium lactate though not without evidence of the tendency to loss

Parhon (1012) demonstrated that intensive thyroid feeding up to lethal dosages adminis tered to 9 rabbits produced a definite loss of calcium Kummer (1017) studying an exoph thalmic gotter nationt of 12 years found that the urine calcium excretion was normal on an intake of about a grams of calcium dails from milk but that the fecal calcium elimination was large Michaud (1930) reported in creased calcium elimination in thyrotoxic gotter Snapper (1933) found hypercalcuria of almo t three times the normal value in a case of Basedow's disease Pugsley and Indurson (1914) demonstrated marked call cium loss of rats fed desiccated thyroid. In 1036 Coryn observed that there is excessive. k s of calcium in the urine Further work by Cope and Donaldson (1937) Beaumont Dodds and Robertson (1940) and Logan Christensen and Kirklin (1941-42) brought forward still more evidence that increased thyroid activity or thyroid feeding are asso ciated with an increased excretion of calcium and pho phorus

The mechanism of these disturbances in hyperthyrouth m has never been clearly demonstrated (6 12 53 66 68 69). Recent thouractl studies (71) would tend further to up hold our hypothesis (61) that the cause of this increased exerction is due to a combination of factors underlying which I the increased utilization of the thyroid hormone by the tissues. When thyroid hormone product in I decreased mineral elimination returns tward normal.

CLINICAL MANIFESTATIONS OF THE DISTURBED
CALCULAR METABOLISM IN HYPERTHYROIDISM

Clinical symptomatology The thy rod gland may affect the structure and functional activity of every component of the human body. For this reason hyperthyroidism presents nu merous chinical manifestations. Manifestations of the disturbed calcium metabolism in this disease are thus also greatly variable. Clinically, they may be absent or so mild that they are masked hy the more predominating toxic symptoms. I amful museular joint and bone complaints are of frequent occurrence (of 59 9 80. Usually these are mild in char acter. Severe forms are rather uncommon and may simulate symptoms of acute positiva

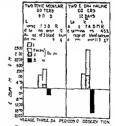


Fig. C pase (calcimbal (1 od ) g land 1 bithat f philaim g t pt t t shoes basal m tabels les limot mi \ t th t philaim s t b u n feale m d g t calcimbalance i m chaptest that od 1 g t calcimbalance i m chaptest that



F 4 M H \ 4 399 g 1 d i po i mod t leopo f th l fth m ru

matic or Sudeck bone atrophy In many instances these have been erroneously diag nosed as a nonspecific and ob cure form of arthritis. The fir t 1gm are swelling and in tense pain on movement with sub equent increasing limitation of motion and atrophy of the muscles involved Tenderness myas thema contractures of muscles and pseudo tixation of joints may later occur. In these more advanced ca es the patient often be comes bedridden. In the early stages roent geno\_raphy reveal a generalized mottled at rophy later there is more diffuse resorption with los of normal trabeculations (Fig. 4) These phenomena may be manifestations of an autonomic nervou system di turbance which is frequently present in hyperthyroid m In such case high calcium and vitamin D teedin\_ as well as thyroidectomy bave been found to give definite symptomatic relief even though roent enograms did not give and nee of recalculcation ( o 80) Ordinary medical mean except morphia failed to relieve the severe pain suffered by one of our patients (M H ) but adequate calcium phosphorus and vitamin D gave prompt rehef

There I grater tend not for the livel pment of symptom of the disturbed call ium and pho phorus metabolism in exphibalmic softer patients than in lattest with too modular gotter. This is probable due to the fact that loss of lime salts is usually much greater in exophithilmic potter. The manification of toxicity in nodular coster are more frequently in ideas of that they may out if it vears before adequate treatments in titutel and therefore slow loss occurs over a line period of time. It is also possible that tower nodular gotter patients is however unally eller nodular gotter patients is however.

Skeletal decalcification Skeletal decalcit ca tion had been de cribed by you Recklin hau sen in 1891 Many similar report of bone atrophy have since been mad \ \ \text{on I eckling} hau en and Koeppen put li hed accounts of a woman of 23 years with exophthalmie guiter of years duration At autopsy the bone sawed like rotten wood the stemum and cal varium being readily cut with a knife. Hi to logically resorption spaces were abundant in the bone cortex and they often contained whole nests of osteoclast He believed the a form of o teomalacia econdary to Basedows disease Von Recklinghau en tated that the degree of osteoclastic resorption vas equalled only by that found in a case of gen ralize ! o teiti fibrosa cy tiea tudied by him In 1901 Askanazy described necropsy finding of a women of at years with retro ternal goiter of a years duration ith carcinomatou d generation and with metastases to the lun The histolomical picture revealed osteoclastic resorption of bone of greater se erity an lex tent than could have been predicted from the macroscopic appearance of the bone Latzko (1901) found hyperthy rollism present in 6 of 130 cases of osteomalacia Hoennicke (1904) attributed the decalcification observed in thy rotoxico is to a di turbance of ph I horus metabolism Cur chmann (1919) reported 30 cases of nonpuerperal osteomalacia some of which were associated with hyperthyr idi m Plummer Dunlap and Mor and Dunlap and Moore (10 8-20) rep ted osteoporo i Four were secondary t ex in thalmic and I to adenomatous goiter They were all women The ages ranged from 20 t

64 years The duration of symptom of hyper thyroidi m was from 1 to 13 years The basal metabolic rates varied from plus 27 to plus 74 per cent. One patient had been bedfast be cause of so called arthritis The bone le sions on x ray examination were suspected of being carcinomatous metastases in patients but further study ruled this out At autopsy the ribs of a 33 year old woman with exoph thalmic goiter of 13 years duration and a basal metal olic rate of plus 41 per cent re verled multiple pontaneous fractures. They were friable and could be easily crushed be tween the fingers Marked generalized osteo porosis was also present. Hunter (1930) re perted the summary of a necropsy done by l rof Turnbull on a girl of 19 with exophthal mic goiter of a years duration. In tologically lacunar resorption by o teoclasts produced much rarefaction of the corticali the spon giosa and the medullary cavity woman of 28 years with exophthalmic goiter of s years duration showed similar severe osteoporosis

In 1912 Osterberg and Mill using Mayo Clinic material concluded that chemical and roentgenographic study of bone removed post mortem from the ribs and pelvis of 23 hyper thyroid patients and of 75 control subjects failed to demonstrate a sufficiently constant difference in percentage of ash percentage of calcium calcium to pho phorus ratio or roent genographic opacity to warrant a conclusion that hyperthyroidism is always accompanied by some degree of osteoporosis. They stated that obviously ingestion of calcium is not con trolled premortem in clinical hyperthyroidism so that the re ults of work of this nature apparently can be only inconclusive. In experi mental hyperthyroidi m in estion of calcium may be controlled Smith and McLean as well as Drill reported that chemical studies of bones of rats with severe hyperthyroidism in duced by thyroid feeding which were fed imultaneously a diet adequate in calcium did not reveal osteoporo i Unfortunately their control of exogenou calcium was not entirely sati factory

A kinazi and Ruti hauser (1933) stulled pathologic material from 7 ases in which patients had died of Graves disease. Osteoporo

sis of some de rice was evident in all. In 1938 Martos examined the bones of 12 patients who had died of evophthalmic goiter and found osteoporosis in 11. In 1938 Crotti reported the summary of a necropsy on a woman of 34 with evophthalmic goiter of at least to 3 year duration. The x ray examination showed generalized osteoporosis especially in volving the bones of the lower extremity. A spontaneous fracture of the upper third of the right femur was present. The bones cut easily and could be cru hed with the fingers. Histo logically, the bone marrow showed almost complete absence of bone forming tissue in the softest areas.

Radiologic findings. It was Kummer in 1917 who presented probably for the first time roentgenographic evidence of osteoporosis as sociated with hyperthyroidism. Roentgenography in the early disease is insually negative but in advanced stages generalized decalcification of the skeleton may be obvious as has been reported by numerous other observers (Fig. 4). This osteoporosis must be different tated from that of several diseases. Among them are hyperparathyroidism malignancy metastatic to bone senile osteoporosis at rophy of disuse osteomalacia and osteoporosis which may accompany pancreatic diabetes as well as pituitary and adrenal disorders.

Mer calcium elimination studies as well as radiologic examinations of the skeleton of one patient Lummer judged from the roentgeno grams that the calcareous demineralization affects the bony system Bernhardt in 19 7 made roentgenographic studies of a woman of 47 years with exophthalmic gotter These showed a decrease of calcium in the bones Aub and his associates in 1929 observed sim ilar changes and pointed out that in mild cases esteoporosis can be detected only by direct comparison with the same bone of a normal person exposed on the same film at the same time Hummer Dunlap and Moore and Dunlap and Moore found roentgenographic evidence of severe osteoporosi in 4 patients with exophthalmic goiter and in 1 with ade nomatous gotter In 1930 Donald Hunter stated that in his experience controlled roent genograms of the bones in exophthalmic goiter revealed a decrease of calcium in less than half

the cases examined Stettner has reported an interesting case of decalcification of the bones of a child resulting from the continued ad ministration of thyroid. After the thyroid had been discontinued the bones became denser Golden and Abbott made a roentgenographic study of 110 case of hyperthyroids m in 1933 The age of the patients varied from 6 to 68 years The duration of thyrotoxic symptom was from months to 6 years In 63 in stance only chest films were available. In the remainder there were films of the spine pelvi or extremities Eleven per cent showed slight while it per cent showed definite to marked decalcification. In a unselected cases a comparison was made to normal following Aub's method These patients ranged from 22 to 50 The duration of disease was from 4 months to 4 years in 5 instances it was not over 6 months. Of the o cases 5 showed defi nite evidence of osteoporosis and one slight decalcification Still others such as Means Hertz and Lerman (1937) Coryn (1936) Crotti (1938) Bartels and Hashart (1938) (9) William and Morgan (1940) and Mans bacher (1941) set forth their roentgenolo ic findings which su rest that osteoporosis is by no means rare in hyperthyroidism. Although the chronicity as well as the severity of chinical thyrotoxicosis is an important factor cases have been reported of moderate thyrotoxicost of short duration with definite evidence of osteoporosis on the x ray film

Turbler symptomotolo 3 esteomotoca greater deformits desorption and sponlaneous fractures deformits desorption and sponlaneous fractures that a few cases osteoporosas 1 profound in degree O teomotoca has occurred with on sequent gross deformits of the bones and dvarfin. In some cases spontaneous fractures have resulted. The seventy of these symptoms depends upon the stage the duration and the complications of the dhesase at the time of diagnosis as well as upon the degree of calcium excretion and the amount of calcium intake during the entire ourse of the dhesase.

D tormits and dwarfism may be due to fracture or score o teomalacia. Subjective ymptom are often associated. The patient of son Recklinghausen and koeppen who had o teomalacia complained of backa he which

caused her to notice that her pine wa trute! I am in both arm and sometime cramp in the hands and feet were also present to Lypho colio is was present Askanazi s pa tient with osteomalacia and goiter was in be with sacral backache followin a sli ht fall Latzko (1001) and Tolot and Sarvonat (1006 again drew attention to the combination of o teomalacia and hyperthyroidi m. The lat ter reported a single case. They had found in observations in the literature on the r lation of these two condition Von Jak ch and Roths (1908) reported softening an I ben lin of the bones in a girl of 20 who suffered from hyperthyroidism and Bernhardt (10 7) ob erved a similar case

One of the patients of I lummer and Dunlar (19 8) had been bedfast because of so call 1 Another showed spontaneou fractures of the rib and o teomalaça at nec ropsy Hunter (1030) reported 2 cases in which spontaneous fractures occurred. Snapper (1933) stated that the o teoporo 1 produces much generalized pain and that it is definitely benefited by thyroidectomy Coryn's patient a woman of 35 years pre sented painful ost oporo i e pecially of the tibiae Another of his patients a woman of 61 years with Basedow's disease of 9 years dura tion decreased in her ht from 16, to 139 meters and sustained a multiplicity of pontaneous fractures of one femur radius and vrut associated with extreme decalcification. If believed that thyroidectomy benefited these patients Gottlieb and Schachter Nancy s (1037) patient a female of 53 years with exorphthalmic goiter of s years duration sus tained two spontaneous fractures of the n ht humerus and showed marked decalcification with a thin line cortex on x ray examination

One of the patients of Means Hertz and Lerman (16.27) who had had hyperthyroidsm for 6 years was driving her automot the when she was suddenly seized with Link like pain in the region of the lumbar si me. V roent genegram demonstrated marked dealerfar ton of the entire spine and pelvis and a compression fracture of the first luml ar vertel ra-Another patient a fermal of 8 had kein kel viden because of long, standin or the first Dorsal kyphosis with flaring of the ribs was present Followin, thyroidectomy she grad ually returned to her normal activities and the kyphosi improved greatly. Some of the im provement was attributed to an adequate diet of calcium and vitamin D Moehlig and Adler (1037) mentioned the painful bones associated with hyperthyroidism They did not believe that marked benefit could be derived from thyroidectomy Crotti (1938) reported 4 cases of exophthalmic goiter and 1 of torse nodular goster who presented a variety of mu culo skeletal symptoms. The age range was from 10 to 61 years Three nere females and 2 were males Duration of toxic symptoms va ried from 6 months to 5 years \ ray exami nation showed definite osteoporosis in 3 and pos ible osteoporosi in i One patient who came to necropsy showed intense decalcifica tion with a spontaneous fracture of the upper third of the right femur. Three patients showed remarkable improvement of the skele. tal symptoms following the roidectoms

Bartels and Haggart in 1938 added more cases of primary hyperplasia of the thy roid with multiple spontaneous fractures of the femur and vertebrae after slight lalls or stooping They were females of 50 and 78 years The toxic symptoms had been of 9 and 17 years duration respectively Jung and Jacob (1939) described a fracture of the left clavick in an elderly woman with a teoporosis and hyperthyroidism Williams and Morgan (1940) added 7 cases of thy rotoxic osteoporo sis sen at the landerbilt University Ho mital They were all females and their ages ranged from 39 to 63 years Toxic symptoms had been present for from 3 months to 20 years The ba al metabolic rates varied from plus 31 to plus 6, per cent lour were toxic nodular and 3 were toxic diffuse goiters. Four pa tunts experienced mu cle or joint pains before bone abnormalities were recognized. One exhibited scoliosis and tenderness over the lower thoracic and upper lumbar vertebrae. The roentgenograms revealed compression Irac tures of several vertebrae as well as general ized demineralization. Carcinomatous metas tases were at first believed the cause. In one stiffness and bony enlarg ment of many of the joints of the extremities were noted \ rri findings imulate I metastatic tumor \ \ third

patient presented a pathologic fracture of the femur and generalized osteoporo i other showed compression fracture of the lumbar vertebrae Metastatic tumor was con sidered \ ray examination showed marked generalized demineralization of the skull and long bones as well as of the vertebrae The fifth patient showed kyphosis of the dorsal pine Marked osteoporosis of the ribs and spine was exident on x ray examination. An other patient revealed marked weakness and atrophy of the muscles e pecially in the hands She sustained compression fractures of the thoracic vertebrae and demonstrated general uzed decalcification. Three of th ir patients exhibited tendencies to fall and one remained mactive because of fear that she would fall Two improved symptomatically following thyroidectoms but none exhibited roentgeno graphic evidence of increased calcification 3 to 14 months after operation. The diet how ever was not carefully managed

Mansbacher's patients women of .8 and 61 years also complained of persistent pain in the shoulders and of kyphosis and back pain respectively \ ray pictures showed general ized osteoporosis Thompson (1044) recalled a minister with hyperthyroidism who was re ported suddenly to have become 2 to 3 inches shorter on Sunday while preaching a few weeks after a thy roudectomy He had suffered from spontaneous fractures of two sertebrae I ray examination revealed uniform decalcification Two (M H and D D) of the 5 pa tunts whom we report herewith showed gen eralized osteopotosis One (M II) showed remarkable improvement of the associated musculoskeletal symptomatology and reten tion of as much as grams of calcium and 1 2 grams of pho phorus daily when adequate amounts of these elements were supplied They both showed clinical improvement fol lowing the roidectomy although the x ray pic ture even 5 months later showed no approciable change except for definite recalcification of the hand boncs of M II after continued adequate mineral intake. This may be explained on the basis that they had hyperthy roidism for a few years and that it would take many more months of adequate supply to replace completely the lipleted store. On

patient (l. M.) complaine l of moderate deer aching pains of the extremities. Another pa tient (M C) complained of occasional vague pains over the entire body but especially of the lower extremities

Calcium and production of goiter An upset of the calcium metabolism has been consid ered by many a factor in the production of goster since early in the nineteenth century (28 61) Investigators have all o believed that a disturbance in the calcium metabolism is causally related to some of the toxic symp toms of hyperthyroidi m But not even the gro s disturbances were revealed until re cently (6 61) Lyen though the total blood calcium is usually normal a disturbance of one of its fractions may be present (54) Thi problem needs further investigation. The total protein levels (see tables) are usually nor mal Slight decrease may be expected in 30 per cent of the cases the level averaging > 7 grams per 100 cubic centimeters of plasma and ranging from 3.4 to 3.9 grams (normal 6 to 8 gm (o) Only one was decreased to as low as 4 9 grams per cent Compare with Bartels findings (8)

Clinical hyperthyroidism and hyperparathy roidism In hyperparathyroidism with its usual hypercalcemia and hypopho phatemia there frequently results metastatic calcification Urmary stones occur in about 50 per cent of the recorded cases ( ) and constitute one of the seriou complications of this disease. In hyperthyroidism on the other hand with its usual eucalcemia and euphosphatemia even in the presence of increased calcium and pho phorus excretion equal to or often greater than that in hyperparathyroidism (Fig. ) metas tatic calcification rarely occurs (48 53) Un nary stones are uncommon and are probably only coincidental Cases of simultaneous hy perfunction of the thyroid and parathyroid gland have been reported (52) The real danger in feeding hi h calcium and pho phoru preoperatively to patients with hy perparathyroidism is that it may increase the predupo ition to metastatic calcification. In

In 19 6 we discovered incidentally while doing iodine and calcium correlation studies that one of the patients with hyperthyroidism

hypertbyroids m no such danger exist

do el remarkal! ret nti n of cal ium over normal when enough an given to met the increased metabolic requirem nt of the dis ease (66) The demonstrated to us the pos sible need for adequate calcium theraps and led us to investigate the effect of calcium feeding upon the negative calcium balance of hyperthyroids m Until that tim been believed that inge tion of extra amounts of calcium did not influence the retention of calcium Since then we have given all of our hyperthyroid patients calcium pho phorus and vitamin D preoperatively. In this repect it is significant that none of the pati nts who received an adequate upply of calcium phosphorus and vitamin D d veletal so called thyroid crisi The po toperative nac tions have been minimal There have been

no deleterious effects (64) Certain patients with impending thiroid crisis who did not react to iodine or who es caped from todine control sub-equent to pro lon∘ed admini tration of iodine were treate l successfully and more quickly prepared for surgery by use of adequate amounts of cal cium pho phorus and vitamin D as well as jodine and proper general management with out employment of an iodine vacation. I a tients with severe acute spontantou exacer bations of hyperthyroidi m were more easily brought under control and more adequately and promptly prepared for surgery by use of the common conservative methel includin judicious bed rest and control of phy ical activity freedom from emotional strain to gether with a lalanced diet of hi h vitamin he h protein he h carbolivelrate and high caloric content and iodinization along with added calcium pho phorus and vitamin D

The fundamental importance of these chircal factors in the management of hyperths roidsm ha led us therefore to attempt to determine the effects of adequate calcium phosphoru and vitamin D therapy on the gross disturl an e of the calcium balance in this disease

#### EXPERIMENTAL METHODS

The principles underlying the clinical and laboratory method have been set forth in de

tail in previou papers (61 6 63 66) In vestigations were accomplished under strict conditions of supervision with only those di rectly in charge of the work being permitted to handle the food the specimens and the medications of each patient. During a preliminary or observation period of at least 4 days to establish exogenous control of the calcium and phosphorus metabolism the pa tient was reviewed historically and physically as well as by laboratory methods including the complete blood count urmalysis essential blood chemistry radiologic studies and liver and renal function tests to determine suit ability for study. At the same time the pa tient selected a constant adequate and palat able diet and became adjusted to the new diet and new procedures. Whereas our previous studies have been confined almost entirely to low calcium intakes in this study many peri ods on a high calcium diet were al o included to follow periods of low calcium intake. The calcium content of the diet was increased principally by the addition of milk. The high calcium diet was supplemented by use of dif ferent sources of calcium phosphorus and vitamin D. The daily fluid intake the salt intake and the acid base values of the diet were kept constant. The diets given and the dietary methods used are presented in another paper (5, 61) We considered the nitrogen balance because it has been shown that this usually remains negative in the hyperthyroid patient unless excess protein 1 given to main tain a positive balance. We did not do mitro gen balance studies An allowance of 1 gram of protein per kilogram of body weight is usually enough to prevent nitrogen loss if a sufficient caloric intake is maintained to prevent loss of body weight. These patients were maintained at a constant a cight throughout the low and high calcium and pho phorus feedings and the protein content of both the high and of the low calcium and pho phorus diets was kept constant at 1/2 to 2 grams daily per kilogram of body weight. The car bohydrate intake was kept high. The fat in take was kept lon

A perchloric acid method (61) with minor modification was used for the determination of calcium in the food urine and feces. The

scrum calcium was determined by the Clark and Collip (13) method the blood phosphorus by the method of king (33) the blood phos phatase by a modification of the Bodansky method (70) and the blood total proteins by the falling drop method of I agan (36)

EFFECTS OF ADEQUATE CALCIUM PHOSPHORUS
AND AFFAMAN D ADMINISTRATION ON THE
NEGATIVE CALCIUM BALANCE OF HYPER
THAROIDISM

Six patients with hyperthyroidism were in restigated over several periods on diets of relatively low calcium content which were followed by periods of study on diets of high calcium content with added milk as the principal source of increase. The high calcium diets were then supplemented during subsequent periods by different sources of calcium phosphorus and vitamin D. The protocol and results of the investigations of one patient (F.W.) have already been presented (66). Those of the other patients may be reviewed hirefly as follows.

W II to 4 399 white f male f 523 ars of age cate 1 Uni rs to H spital n March 31 194 f t th suggal tre tm nt of to ic n dul go ter She h dhaig trfor years She i es nted a he She h dhaig it not years one is meet and to so fixpecial ty end largotte of 3 years dur to the ympt ms actual ag acre of her o sn ss palputat on fatigat I to hat int I ance and acre so perspation. There we pressure symptoms of distinct and occast and disphaga. The appetite was so ac the food at ke g at and the as n eight loss to 8 months p 1 adms son the predomin at symptoms of hyperthy roid sm were r fe able to th musculoskel tal sys tem These im lat d the ymptoms of acute post matice S decks b neatr phy Shee my lained of 1 Hag t der ess and of intense pain of the uppe a ms n mo em at f the sh uld r joints with sub equ t I mit tion of m t n i thes jo nts Gen I zed mya thenia and m cle ni joint p ins a re a soc ated Th my asthema was so severe that she beam I dr lien The pan was so nt ne that sh requir d morph a on s v al ccas ns Ihy cale amout n ld fully well nour i h dwh t f mal wh h bited consid rable app e h as a and marked trem is of the hands. The c was no x phthalm nd the exophthalmometric r ad ngs w e 6 millimeters which are normal The thorod as e I ged and nod lar The skin w \* m and mout and a tachycard a was present Acts e and passi e mos ments f sh ld r joints e ema k dly himited by a se e pa n R fle es wer h pe act se

TABI	LF II ~	DATA	FOR V	111	\ 41	1_399	HIII W	FFV	LF OF	1 151	L W Z A	титоу	ic soi	VI AL GOITER
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There was remarkable improvement of the entire musculoskeletal symptomatology Con siderable improvement in mo em nt of the shoulder joints was a octated. The basal metabolic rate decreased from plus 3, to plus 17 per cent on general mana ement without iodine Calcium studies on a low calcium diet averaging 1 100 milligrams per perio 1 showed definite increase in loss of calcium over normal With the admini tration of extra amounts of calcium (Table II and Fig ) the patient retained as hi h as 2 grams of calcium and 1 2 grams of phosphorus daily After 8 days of high calcium feeding she experienced remark able relief from pain. Movement of the shoul der becam progressively better The myas thema decreased so that she was able to sit up un a chair Roentgenographic tudies male 5 month after the operation following continued adequate calcium therapy showed no appreciable decrease in the osteoporo is of the humers but definite improvement in that of the hand bone M an H rtz and Lerman

reported a similar case in which calcium and viosterol were administered with relief of symptoms but roentgenograms taken later did not give evidence of recalcification Since our patient probably lost a considerable amount of calcium during the 3 years of hy perthyroidism it is possible that it will take more time to replace this loss. This should explain the failure of complete recalcification to become apparent on the roentgenograms after 5 months of adequate calcium phos phorus and vitamin D therapy following thyroidectomy

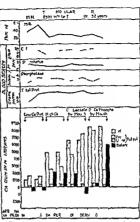
This study again demonstrates the differ ence in the calcium excretion between exoph thalmic gotter and toric nodular gotter which is not so great in the latter. The maintenance of a positive calcium balance with a milk diet as well as with various calcium salts is also

re-emphasized

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Calcium and pho phorus met b 1 c stud es were made from May o to M + 25 194 Duri g th first od ; a low cale um diet (Table III and Fig 6) sg en Than I llor ed by a det high in cal ci m c nte t pracip lly due to add tion of 600 cub c centimet is h m g nized m lk supple me tdbs 5 afrsofical D

Mr the in tigation iod ne as given with ut f threh nge th ba I metabol c rate and a s I total the roidect my was done. Goes and mic. cope tud ho el volne of o call d mi ed g ite with my a e sof hyperila tich

During our study of this patient there was a definite trend to clinical amelioration to gether with a slowly decreasing I asal meta

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curred over normal (Table III and Fig 6) When more calcium was supplied principally from milk and wafers of dicalcium phosphate with viosterol a sudden reversal of the cal

Id i

cum balance occurred with considerable re tention of calcium (Table III and Fig 6)

57

This patient with mixed goiter showed a greater excretion of calcium than the ususl patient with toric nodular goiter but less loss than the usual patient with exophthalmic goi ter She clearly demonstrated retention of calcum when the nutritional needs for calcom were met

LM N 408788 a white im le 145 y are tered Um e ity Il pit 1 n Decemb r 11 94 phthalmieg tr Sh em for m nag m t fe plied bitte ly of m kd ners s rrt blits se eep lottat n a d m ti hal not blty Abo t t not c as d im athprito dm h beg s M kdtembl g ! dage ald rvo th et mtes hed hs esy fat g blty pres t persp ratio t henek whh loly she brvda e ght lo f f om 65 to 47 1 became l g pou do a c mpan ed these amptom I adit the eem le t d p h ng p ns of the pper trem te P lyd ps and poly l ch k g nese t alog th ca

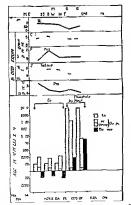
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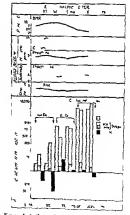
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This woman presented severe exophthalmic gotter verging on a thyroid crisis. She improved greath on general management with high cal ium intake and the basal metabolic rate decreased from plus 115 to plus 64 per



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TABLE 1 - DATATOR I M > 408171 COLORED HI MALE OF 1931 ARS WITH I NOT HITH MICCORD

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cent The total blood sodine decreased to Q 11 with the organic fraction 2 43 micrograms per cent. On a relatively low intake of calcium averaging i 0,3 milligrams per period there occurred a marked negative calcium balance reaching a maximum of 3 110 mills grams per period (Table IV and Fig 7) A diet of high calcium content principally due to added milk was then given On this in creased intake of calcium 650 milligrams per period, there developed a remarkable and early reversal of the balance with maximum retention of 1 677 milligrams of calcium per period (Table IV and II, 7) A decrease in retention of calcium to definite loss occurred in period 1 and 11 when the high calcium diet was supplemented by calcium gluconate The blood serum calcium remained within normal limits except for a definite rise in period II The blood pho phorus and total protein remained within normal limits. The blood pho phatase was lightly increased in the first tyo periods but normal in other periods

56

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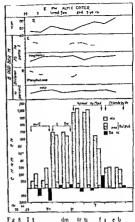
ti e The ba 1 m tabol c rate on \ vember 21 1010 splu 48 pe c nt w th th b sal temperature of a deg ees the pul e rate 92 the respiratory rate 15 th blood pres ure 130 systol c and 60 d astolic nd the we ght 54 kil g ams Blood iod ne was 20 90 micr grams pe cent w th th acetone ins 1 blef ac ti n 4 48 m crograms per cent. The blood pr throm bin wa 73 per c nt f normal. h ch is w thin no m I ra ge Blood amvlase wa 68 units The hlo d a oo and ch lest r l 15 m ling arms per \$1172 Blodueantro n a 45 millg ms per cent Th hppu c dle function test as 23 g ams a d cra bel w normal Th ph nols l phthale n renal funct on test sho ed 60 per cent xc tion 1 th f st ho rand 5 per cent excret n du ng the s c d h r after intr n s adminis trati n Flectr card ogram sh w d nus tachy car Roentgen gr phy f k leton sh wed no d t ct bl pathology C lc um and phosphor s balance studes wer

Creum and pnorphor's basines studies well male frm N mbo at 90 t D cember 18 194 V consta tio calci m d t (Table V and 198 Nech was such lot he pat mt as g m l ngth first 6 l). The pice lby a high calcim d t (Table V and 198 Nech was such lot he pat mt as g on cubic centimeters it moge d mikel divide a flowing 6 as Y n gram the high calcimeter 1 (a) so the pice mt h high calcimeter 1 (b) so the complete mt from the high calcimeter 1 (b) so the complete mt from the dute, the pe d M 19 gree 1 Vill and 1 N the picent retro d to the waste underly 1 N the picent retro d to the waste underly 1 N to picent retro d to the waste underly 1 N to picent retro d to the waste underly 1 N to picent retro d to the waste underly 1 N to picent retro d to the color to

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During our investigation the woman de veloped a diarrhea and slowly increasing basal metabolic rate of from plus 48 per cent on November 21 1940 to plus 83 per cent on December 13 1940 The total blood 10dine however decreased to 10 00 with the acetone insoluble fraction 54 micro rams per cent and the other clinical symptoms improved durin that period On a low intake of cal cium averag ng 1 063 milligrams per 3 day period there was marked loss of calcium (Talle \ and I ig \sqrt{) A reversal of the bal ance with moderate retention of calcium oc curred in periods III and IV on a diet of high calcium content principally due to added milk During periods V VI an IVII an uncontrell able diarrhea developed resulting in decreased



Fg 8 It dm tru fieb to m trs f pe tealen m blind 3 times daily man t med ret t feal m pt f co t ll bl d m hea

retention of calcium in spite of a high calcium diet supplemented by 10 grams of calcium gluconate daily by mouth. The diarrhea continued during period VII even though only 750 cubic centimeters of milk was administered daily During periods VIII and I the patient returned to the low calcium diet supplemented by intravenous administration of 10 cubic centimeters of 10 per cent calcium chloride three times daily which maintained a reten tion of calcium in spite of the diarrhea. The blood calcium was slightly increased during period I (Table 1) but ranged within normal limits on other determinations The blood phosphorus was normal on several determina tions The blood phosphatase ranged from 4 4 to 7 9 Bodansky units and was definitely socreased on few occasions. The blood protems ranged from 5.4 to 6 , grams per cent

TABL	EVI-	DITI	FOR D D \ 41881	WHITE	uu	E OF 2	71E1	RS 11 17	H F70	PHTH	THIC COLLE
			Calcum				\$1	ood.			
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These findings illu trate the negative cal cium halance found in exophthalmic goiter and the maintenance of a positive balance on a high calcium intake. They allo reveal the development of calcium retention by the use

of calcium chloride intravenously in spite

of diarrhea

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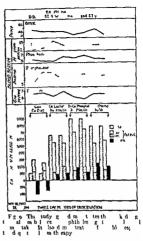
acidl erf net n test yield da o grams Roenteen og ams of the ve tebral c I mn sh lder and knee ) ints and both hands sh wed a slight decalcification

Calcium and phosphorus metabol sm stud es were perio med from No emb 1 18 to Decembe 12 1011 Du 1 g the first 6 days a det flo calcium cont nt as gi en (Tile VI nd Fig o) A diet f high cal cium cont t (Table VI a d Fig o) principally d e to add to of 600 cub c cent meters of homog no ed m lk d ily was th n administered supplemented by 3 grams of calc um lactate and to d ops f dr sdol (2500 un is its in D) daily by mouth for 6 days. The high calc m it as i ters pplemented with s d cal D waf rs da ly by mouth for 6 days D ring the last 6 d vs the high calcium diet was supple ment d'a th 10 cubic centimeters of 1 per cent cal cium chl r de three t mes d ily by vein

A reg men I complete bed rest adequate seda tion an! h gh calcium high phospho us h gh vita and high calor c intake as vell as ad quate 10d 12ati n wa later foll ed On this eg men the Las I metabol e rate decreas d to plus 20 pe e nt on December 5 with the ba al pulse rate 84 the tem perat e 98 degree the resp at 73 rat 14 the blood pressure 12 3 stole nd 68 d astole and the weight 17 pounds Blateral 3 bt t 1 thy 1d c t my was l e n Decemb r 17 1941 f llo ed by a une ntí leo valese e G oss ndm croscop e

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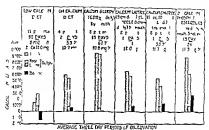
During our investigations on general man agement alone without iodine the patient im proved clinically and the basal metabolic rate decreased from plus 45 to plus 31 per cent The total blood jodine was 6 to with the acetone insoluble fraction 1 51 micrograms per The muscle and joint aches subsided The basal metabolic rate further decreased to plus 20 per cent after adequate iodinization Much loss of calcium occurred on a low calcium intake (Table VI and Fig. o) There was prompt response to added calcium in periods III and IV with a calcium retention of as much as 1 131 milli-rams per period. Leriod V and VI showed a lurther increase in reten tion of calcium on a hi h calcium diet supple mented with wafers of dicalcium phosphate with viosterol \ still greater increase in the VIII on the high calcium diet supplemented by calcium chloride by vein. The blood calcium was loun I to be increased on 5 c casions (Taile \I) The bloo I pho phorus was in reased on one ceasion (Talle VI) The blool phyphatase was letinitely in reased (lat) (1) The total proteins ranged within normal limit (Table VI)



This study again demonstrates the marked negative calcium balance in exophthalmic goi ter on a low calcium intake. It also demon strates the response to calcium therapy with a marked retention of calcium and a reversal to a positive balance which is casily main tained on three different types of calcium

#### ANALYSIS OF STUDY

Gross disturbances of the calcium (Table I and Fig 1) and phosphorus (64 65) metabo h m in hyperthyroidi m vary greatly but are characterized chiefly by a grave lo s of these elements both through the gastrointestinal and urmary systems when their intake is kept I w or even optimum for normal persons they are usually temporary prevental le and reversal ke in character. They can rea tily be entirely controlled by inge tion or parenteral administration of adequate amounts of cal



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cum and phosphorus Thete are some who have believed that the state of the calcum balance in byperthyroid m is independent of the actual calcum content of the diet. In 1936 we were able to prove for the first time the fallacy of this behief. Diets of high calcum and pho phorus content principally due to added milk (600 to 1500 cc daily) lead to consistent regular retention of both calcum (72ble VII and Fig. 10) and phosphorus (64 6). We have also supplemented (64) the high calcum and high phop phorus diets with four

of the most common types of calcium salt used in the rapy (Table VII and Fig. 10). They were all effective in maintaining retention of both elements. Eleven hyperthyroid pritients maintained on a relatively low intake of calcium averaging 474 milligrams per day over a total period of 90 days showed an average loss of 450 milligrams per day (Table VIII and Fig. 11). When 5 of these patients were in vestigated on an adequate intake of calcium from different sources averaging 2410 milligrams per day but ranging from 1622 to

TABLE VII -EFFECT OF CALCIUM FLEDING AND OF PARENTERAL CALCIUM ON CALCIUM
BALANCE OF SEVERAL CASES OF HAPPETHAROLDISM

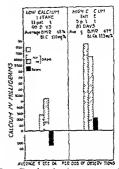
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3 560 milligrams over a total period of 81 days remarkable retention of calcium re sulted (Table \ III and Fig 11) The state of the phosphorus metabolism (64) showed simi lar speciacular changes with much retention of the element as will be reported in detail in another communication (6) Retention oc curred whether the extra calcium was fed (Table VII) or administered parenterally (Tables V and VI) and in face of a severe diarrhea (Table V and Fig 8) In our series wafers of dicalcium phosphate with viosterol were instrumental in producing the most marked retention of calcium (Table VII and Fig 10) when the amount of each drug was administered within reasonable limits of pal Dicalcium phosphate with vios terol also produced the greatest retention of phosphorus (64 65)

The disturbances of the calcium metabo lism due to hyperthyroidism are usually tem porary in their effects on bones, but at times and especially in long standing hyperthy roid ism in the presence of insufficient calcium in take permanent nathologic changes of bone may occur which have so far not proved ame nable to therapy of any type Practically this far advanced stage can be best treated by pre vention with adequate calcium and phos phorus feeding and early diagnosis and treat m at of hyperthyroidism Muscular joint and bone pains as well as myasthema are as sociated frequently and have been treated successfully with extra amounts of calcium pho phorus and vitamin D by others (50) as well as by us One of our patients (M H) presented prominent musculoskeletal symp toms I ain was so severe that she required morphia on several occasions. Wasthenia was of such intensity that the nationt became bedridden \ ray examination revealed slight



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osteoporous of the entire skeleton with moderate to severe osteoporosis of the left upper humerus (Fig. 4). Administration of adequate amounts of calcium and phosphorus resulted in retintion of as high as grams of calcium and 12 grams of phosphorus daily (Fig. 5 and Table II). Within 8 days she obtained remarkable relief of pain. Movement of the shoulders became progressively better. The myasthenia decreased so this she was able to sit up in a chair. Orthopedic treatment has been at times used (9).

These studies reveal that ordinarily hyper thyroid patients require about 2 grams of cal crum per day to maintain them in positive

TABLE VIII -ELEFFET OF CALCIUM INTAKE ON CALCIUM MET BOLISM OF SEVERAL CASES
OF IN PERTHYROLDISM

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calcium I thince which I at least twice the optimum calcium requirement for normal adults. Phosphorus requirements an similarly increased (64). When it is realized that the average American diet i barely sufficient to supply the normal adult requirements then it is easily understandable that with the greatly altered metabolism of these two elements in hyperthyroidism grave depletion fre quently evits which should indicate urgent need for the application of prophylactic and remedial measures.

Without adequate milk or cheese in the diet it i usually impossible to obtain the cal cium required by hyperthyroid individual through food alone We have found that milk is an excellent source of utilizable calcium and phosphorus for hyperthyroid patients when supplied in quantities of about one and one half quarts daily. In rare instances diarrhea is present so that no milk, or smaller amounts as tolerated must be given and other forms of oral or intravenous therapy must be resorted to in order to supply the deficiency. It must al o be remembered that utdization of cal cours may be inadequate even with sufficient intake unless the factors which determine ontimum absorption and utilization are main tained such as low fat and neutral or sh btly acid balance of the diet and proper phos phorus and vitamin D intake

Most hyperthyroid patients when seen by the physician have had symptoms for at least In such cases and in cases in many day which calcium los has been severe or has oc curred over a long period of time such as in nationts with obvious osteoporosis 3 grams of calcium daily i a more adequate dose. We suggest that the high calcium diet be then supplemented by adequate intake of some form of dicalcium phosphate with vio terol in order to restore these lost mioerals. This product in our experience seemed to promote the retention of calcium and phosphorus 200 to 1000 per cent over that of other forms of lime salt

At the moment one of the best indication for calcium pho phorus and vitamin therapy is the necessity of managing some patients by nonsurgical mean. Thi treatment constitutes an attempt to prevent the depletion and

tendence to 0 teopor 1 which may exceed when in hyperthyroid in of h it durative even in hyperthyroid in of h it durative. The part ints included would be the inoperative at those who refus, operation and the who for certain reasons are receiving those cill usual medical therapy reentgenotherapy. Calcium therapy is recommended for the ray on that the number of failures in follows these other methods of treatment varies but it usually high. Moreover significant decrease in toxicity 1 often not obtained for several weeks after beginning treatment.

With good medical management including a high calcium high pho phorus and high stramin D intake but without iodine one may usually expect definite improvement in the general symptomatology including the tre mor sweating irritability and hyperkinesis When musculoskeletal symptoms referable to the loss of calcium and phosphorus are present they usually disappear. A maintenance of a good wer ht and a gain in strength a diminu tion in the tachycardia and a decrease in pulse pressure are often associated. D crease in the basal metabolic rate u ually occurs When however todine is then added there is often further clinical amelioration and further decrease of the basal metabolic rate. Calcium and phosphorus do have a definite place as re placement therapy in hyperthyroidism On the other hand we do not advocate their use in place of iodine and the good general medical

management used in the past In comparing the clinical course of those hyperthyroid patients since 1936 who have received adequate calcium pho phorus and vitamin D along with the older properative principles which we used to practice (ade quate mental and physical rest adequate se dation a well balanced diet of high carbohadrate high protein high vitamin an i hi h caloric content as well as adequate iodiniza tion and treatment of existing complications) to that of patients treated prior to 1016 we have e pecually been impressed by the smooth postoperative course and absence of the 50 called hyperthyroid crisis in recent years The po toperative reactions have been minimal and there ha e been n del ten useffects (64) Recause of these observation

base In ate 1 in the above manner without todine vaction the todine resistant patients with evophthalmic gotter with impending thy road cris-particularly following the prolonged administration of todine. This regimen proved successful in introducing remission so that the patient was more easily and more quickly prepared for surgery. Similarly patients with severe acute spontaneous exacerbations of hyperthyrouthism were more easily brought under control and more adequately and promptly prepared for surgery. Long periods of preparation or of hospitalization before operation were thus avoided by this method (fut).

True thyroid crisis is one of the most dreaded and most slarming of the postopera tive complications. It accounts for 25 to 50 per cent of the immediate postoperative deaths in many clinics. It still occurs in spite of iodinization and often occurs in the patient who is refractory to iodine. The causes of refractoriness to iorline and of thyroid cri is remain unknown. The gland of these patients often however shows hyperplasia with thin ning or absence of the colloid These phe nomena are associated with lack of involution of the hyperplastic gland. Most evidence points to the fact that jodine therapy produces remission of thyrotoxicosis principally by in creasing colloid storage of active organic iodine compounds This is will shown by histologic examination which reveals marked colloid in volution of the gland as well as by jodine analysis (62) by radio iodine autography (45) and by ratho todine fractionation (46) of the excised gland which show a high content of thyroxine di iodotyrosine and inorganic io dine in the colloid

In 1920 Kottman showed that calcium in creased the vi cosity of the colloid in the thiroid gland. Cameron pointed out that of tissues other than bone the thyroid gland has the highest concentration of calcium (40 mgm

) Welin revealed that calcium has an inhibitory action on thy room. The studies of ffelling ( o) did not support the view that cal ium has its effect through neutralization of thyroxime. He (to 37) demon trated experimentally that the hyperplastic thyroid six of much or like during simultaneous high

calcium and high iodine feeding. Thompson (15 76) showed in 1933 and 19 6 that in rats on diets containing the same amount of jodine the blood jodine level was comparatively lower in the groups receiving additional calcium Later in 1934 Klein (38) than in control was able to show that a high calcium diet promoted a greater storage of colloid during io dine therapy than with jodine therapy alone It is this augmentation of the storage of col loid which may explain the therapeutic action of calcium in reversing an iodine resistant state to that of sodine remission and in pre venting thyroid crisis Further investigation of this problem is particularly necessary to determine the precide status of this regimen with regard to thyroid crisis to the iodine refractory state and to the effects of preoper ative use of calcium pho phorus and vita The optimal benefits of jodine are temporary and alone seldom constitute a sat isfactors means of control. Up to date our method has been used in preparation for oper ation and not as an independent method of treatment. An investigation of our regimen alone without surgery is now under way to determine whether calcium prolongs the re

In spite of all our knowledge of the thyroid problem there is still much lacking in the medical treatment of hyperthyroidism Wit ness the intensive studies made on thiouracil in an attempt to find a better method of treat ing these patients medically. Thiouracil ther any does result in retention of calcium phos phorus and nitrogen of hyperthyroid patients as shown by Sloan and Shorr and it de creases the blood content of the probably hormonal judine fraction of the blood (19) It offers new hope of more effective medical con trol of hyperthyroids in (5) At the moment however it is too soon to predict whether this drug can be employed safely in the routine management of thyrotoxicosis Unfortunately it has been found by several clinics that thiou racil possesses certain inherent dangers which do not allow it to be an ideal medicament. It is hoped that there will be discovered related drugs or new methods which possess the fav orable action without the toric side effect of thiouracil While such new drug or new

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method are being developed we are making careful clinical and laboratory tudes of thiou racil in compari on to our method of preop erative preparation. It will probably take several years to determine the precise indications and limitations of these method.

#### SUMMARY AND CONCLUSIONS

- 1 Calcium phosphorus and vitamin D medication is of undoubted value in the treat ment of chinical hyperthyroidism. Especial attention must be given to calcium which in the usual diet is barely sufficient for a normal person. Hyperthyroid patients ordinarily require about 2 grams of calcium daily to main tain them in calcium retention. This is at least twice the optimum calcium requirement for normal adults. Three grams daily is a more adequate amount to restore the depleted calcium. Phosphorus requirements are similarly in the calcium requirement and the more deficial to the calcium.
- larly increased 2 Eleven hyperthy roid patients maintained on a relatively low intake of calcium averag ing 474 milligrams per day over a total period of oo days showed an average loss of 4 o mil ligrams per day. When five of these patients were further investigated on an adequate in take of calcium from different sources aver aging 2 410 milligrams per day over a total period of Si days remarkable retention of calcium occurred which resulted in a po itive balance of 36 millionams per day state of the phosphorus balance showed simi lar spectacular and beneficial changes Re tention occurred whether the calcium was fed or administered parenterally
- 3 We supplemented our high calcium and high phosphorus diets with four of the most common types of calcium salt used in therapy. They were all effective in maintaining retention of calcium and phosphorus. However 3 of the 11 patients in our senes received added amounts of phosphorus and vitamin D be sides the added amounts of calcium in the form of dicalcium phosphate with vioistern the form of dicalcium phosphate with vioistern that of patients receiving only added calcium or calcium and vitamin D in palatable does a Howevithvoodism in the intersocio of in

4 Hyperthyroidism in the presence of in sufficient calcium and phosphorus intake often pre luces of finite o teopor 1 whi h may led detected reconferencing alls. Severe cases of osteoporosi may lead to o teomalicus a d pontaneous fracture. Gros deformits sail odvantin may re ult. Practically these conplications of hyperthyroidi m can be treate be thy prevention with feeding, of adeq ate calcium. Pho phorus and vitamin D and early diagno is and treatment of the hyper thyroid m. In late, tages orthopedic meas ures may be necessary.

3 Mu cular joint and bone pair ard other symptoms are often as ociated. These can frequently be best controlled by cal ium pho phorus and yitamin D therapy

6 Calcium and pho phorus along with vi amin D have no deleteriou effects in hyper thyrodism. They have a definite place as replacement therapy. On the other hand we do not advocate their use to replace the sound medical methods of the past including iodinization but rather as a upplement to them. When thus properly used preoperatively, we have been impressed with the much smoother postoperative course.

7 Frue thyroid cri 11 one of the most frequent most dreaded and most alarming of the postoperative hyperthyroid complications in many clinics. It still occurs in spite of adequate iodinization and often in the patient who is refractory to iodine. We feel that properative calcium pho phorus and vitamin I) are important in the treatment of the iodine refractory and the precent; states as well as in the prevention of thyroid crisis. These dias in the prevention of thyroid crisis. These dias clients are being further investi, ated.

8 Adequate calcium phosphorus and vita min D should e pecially be administered to all hyperthyroid patients who for some reason do not come to surgery early. The patients in cluded are those who refuse operation imporable cases and those who are being (reated by thouract) by older medical method by x ray therapy, or by a combination of these methods of therapy.

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#### SUMMARY AND CONCLUSIONS

1 Calcium phosphorus and vitamin D medication is sof undoubted value in the treat ment of clinical hyperthyroidism. Especial attention must be given to calcium which in the usual diet is barely sufficient for a normal person. Hyperthyroid patients ordinarily require about 2 grams of calcium daily to main tain them in calcium retention. This is at least twice the optimum calcium requirement for normal adults. Three grams daily is a more adequate amount to restore the depleted calcium. Phosphorus requirements are similarly increased.

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# THE POSTERIOR APPROACH FOR ARTHRODESIS AND OTHER OPERATIONS ON THE SHOULDER

PAULH HARMON PhD MD 5 yee P mil

¬HE relative inacce ibility of the plenoid face of the capula and the entire acromion from the conventional anterior approaches to the shoulder has led the author to use a posterior route for arthrodesi of this joint Greater familiarity with the shoulder from this side has increa ed the frequency with which this method has been used for other operations As a r sult of this experience the author be lieves the posterior approach to be optimal for (1) arthrodesis of the shoulder ( ) opera tions upon the superior and posterior aspects of the humerus such as replacement of tuber osity fragments and repair of certain types of rotator cuff lacerations (3) operations for posterior dislocation of the shoulder and (4) all operations upon the clenoid except those demanding exposure of only the anterior por tion Tamiliarity with the posterior approach will increase the ability of the surreon to demonstrate types of pathology in the joint other than tho e seen from the front author has used this method for houlder arthrodesis in 10 cases replacement of greater tuberosity fragments in 4 cases for removal of exo to-es on the po terior and inferior glevoid in 2 cases and for exploration of the shoulder joint in cases. This approach is not to be used for operation upon the cora coid the bicep tendon and for most repair in the supra pinatus region

The early surgeous approached the posterior part of the should r joint throw, ha deltod plutine route. This method fell into discreptive because of frequent injury to larger or maller twig of the superior branch of the axiliary nerve. This nerve and the branches of the upper capular nerve to the supra pio atu and the infra pinatus hould not be seen of dama\_ed in any safe po ternor approach

McWhorter in 19 3 de cribed a po terior approach to the shoulder that has been the point of departure for the method de cribed her in Rone and Yee have recently de cribed a poterior approach for r duction and cure of posterior di location of the should r which differs only in certain minor detail from the technique de cribed in this paper.

#### SURGICAL TECHNIOUS

The patient is anesthetized either on the side or in the 30 degree oblique po ition with the shoulder to be operated upon uppermot the entire arm atula and posteror shoulder are prepared and draped. The usual precautions are taken not to expose excessive skin surface

The skin inci ion begins at the middle of the scapular spine and extend along and just in ferior to it outward to the region of the tip of the acromion The po terior extent of the deltoid on in a noted. A subperiosteal dissection ; then mad of the portion of the deltoid originating from the spine of the scapula The detached posterior deltoil i reflected laterally and interiorly in the woun! Care 1 taken not to pull it below the level of the muscle belly of the teres minor and to keep instruments out of the muscle substance of the detached deltoid Injury to the axillary nerve I thus a oided Thi sta e of the desection is shown in Figure 1 with the proposed line of inci ion in the rotator cuff and po t rior tout cansule

With the arm in neutral rotatory position a vertical inci non i made throw he the tendinous portion of the rotator coil. This men sion can be made with impunity if properly placed in the tradinou portion and the operator keep away from the musclelly of the tere minor and the quadrilateral space beneath it through which the axiliary nerve emerges. The posterior j int capsule can then be separated from the perigh heal tin lin us.

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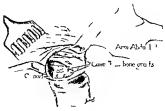


flap of the rotator cuif and incised in any direction distred. Figure 2 shows the dissection at this stage. The approach at this level is practically bloodless being through tendon and joint capsule. The exposure of the glenoid and head of the humerus is more extensive than by any other route except by the sabre cut method

When an arthrodisis is performed the acromion i cut by transverse osteotomy 2 or 2 / inches from its tip and the latter i buried in a slot cut in the humeral head with the arm held in the correctly abducted position in the



Fg D p dis ect caps 1 ope ed



Ig 3 \111 cat fbo grafts f arthodesis.

frontal plane II bone grafts are used in addition they can be accurately laid on the denuded po terior glenoid and the humeral head a shown in Figure 3. Closure of the mei ion can be made by any type of suture material preferred by the operator. The whole arm forearm wrist and torso are then placed in a plaster shoulder spica that has been previously prepared.

If the operator keeps below the spine of the scapula and does not dissect in the muscle belly of the infraspinatus there is no danger that injury to the suprascapular nerve will take place

#### SUMMARY

The surgical technique for a saf poten; approach for arthrodes: of the houlder a other operations; discribed Adher nee to the technique as described keepin the discribing away from the mu clo belile of the infraspinatus and teres minor and below the pie of the scapula will avoid mjury to the aulian and suprascapular nervis

RFFERFNCES

## MASSIVE EYTRUSIONS OF THE LUMBAR INTERVERTEBRAL DISCS

A VER BRUGGHEN MB ChM MS FACS Chie g Ill n

GREAT deal has been written on the subject of the ruptured interverte bral di c but it appears that insuffi - cient stress has been laid on the sen ous complications which may occur when this condition is inadequately treated. The extru ion of a large part of a disc may o com press the cauda equina a to cause weakness of one leg with disturbance of urinary function or even a transverse cauda equina lesion with paraplegia and incontinence of the bladder and ructum Dandy has drawn attention to these seriou cases and it has been casually men tioned by most of those writing on the subject of the runtured discs. Most of the patients with the cauda equina lesions described in this article langui hed for days weeks or months without a correct diagnosis being made seems proper therefore to discuss the symp tom complex and to give detailed case histo rics as examples in order to shorten the pa tient's illness and perhaps obtain better re sults. The condition when severe constitutes one of the rare neurosurgical emergencies and like some other such emergencies the result in pite of prompt and effective treatment may la unsati factors

The symptom complex was of variable degree of inten its from sight weakness of the leg below the knee with saddle hypesthesia and severe sphincter disturbances. In all of attents were seen of whom 8 were operated in and i dued before anything could be done. They represent the seriou complication seen in jershap 100 consecutive cases of typical hemated nucleus pulposus with scattera and without bladder symptoms or incapacitating veakne. In mot cases there was a cogwheel hi tory in that the picture developed in ucce six acute short episodes. Four of the strifted cases were in men and 4 were in more.

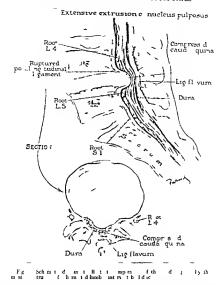
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It is of course quite impossible to general tze from such a small group of cases but there are one or two points which may be of interest and which may be significant. The age group of the patients seems to be between 35 and 45 years All but a had a history of backache for years and all but 2 had a history of both back ache and sciatica for years. A history of trauma was obtained in a patients no history of trauma was obtained in 3 patients and in the other 3 there was an incident which might be de scribed as trauma for instance a severe sneeze or cough As in the case in other types of root involvement most of the patients had pain on coughing and sneezing. The bladder mechanism was not seriously involved in only 1 case Intermittent symptoms were characteristic as was the cog wheel hi tory of gradually progressive spurts of trouble

With regard to the signs presented it may be said that they are those to be expected from pressure on the cauda equina Weakiless and hypesthesia were observed in varying de grees though rarely bilaterally symmetrical The Lastgue sign! was positive in all the cases in which it was tested 8 cases. The deep reflexes in the ankle were affected in all the cases and the knee serks were involved in some or pared in others depending on the level of the compression of the nerve roots Six of 8 of the patients had a tender spine on deep pressure. Five of 9 of the patients showed a narrowed intervertebral space at the site of the hermation of the involved disc. Spinal fluid examination was not significant except for block or partial block when below the lesion and for the reverse Queckenstedt test In 1 case (Case 2) the total protein was high

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## SURGERY GYNECOLOGY AND OBSTITUTION



althou h the fluid was removed from above the le ion but the test was done under circum stances in which there was the polibility of error

The location of the extru ion wa at the lumbosacral joint in 3 cases between the 4th and 3th lumbar vertebrae in case and be tween the 3d and 4th lumbar vertebrae in 2 cases (Fig. 1 and 3)

#### DIAGNOSIS

The diagnosi of a condition such as the

con ideration of the hi tory and of the physical and laboratory inding. I ad to a correct conclusion. The first as a in thi group was not properly diagnosed and neither vas it very well worked up fr. in the point of view of a ruptured dic. Appropriate tests were malfor a pinal cord tumor which in a sense it was. There was so little sensory change a compared to the exten is and marked in the weakness that a variety fint in swere intertained. However, the thir cases all received a correct pre-portatic diam's in cluding that in which in c. frimating peralicidident in the properties of the sensor change a confidence that in which in c. frimating peralic columns in the confidence that in which in c. frimating peralicidident that in which in c. frimating peralic conditions that in the properties of the physical conditions and the properties of the prop

tion was increormed. I nor to consultation various diagnoses were con stered ranging from multiple selerosis through syphili to 1 itt s disease of the pine and metastases to Although these erroncou diag noses constitute the main reason for drawing the attention of the profession to this conditi in little difficulty need ari e with regard to multiple selerosis or syphili However the possibility of metasta es to the pine must be carefully di tinguished from the condition un I r di cus ion. In both there may be a short history of pain in the back with pain down the leas followed closely by weakne's and sphine ter di turbance. The hi tories are dissimilar if carefully taken in that the runtured disc omes on in one or two or a series of incidents (c g wheel ) whereas the metastatic I sion as a rule presents a steadily propressive history In attempting to judge between the two a search hould be made for a primary focus or a hi tory of an operation in which a malignant tumor may have been present the considera tion combined with a careful study of the x ray justure of the spine will u ually bring at ut the c treet d ci ion. I have seen and perated on a patient with metastatic le ions ) the cruda equina in whom nothing ignifi ant was seen in the roentgen pictures before

operation. One of the patients had had a breast removed 3 years before but the tumor contained in it was not thought to be malig nant In this case a neurological colleague ad vised operation on the basis of the probability and certainly possibility of a ruptured disc In both cases the chest and spine films were considered to be negative. I oft a disea c only occasionally causes cauda equina signs and symptoms but the history 1 short a few days to 2 or 3 weeks as in metastases to the spine Here again the vray films of the pine may not belo for tuberculous granulation tissue may form and compress the spinal cord with out producing significant changes in the x ray tilm Spinal cord tumor must receive considcration but the shortness and jerkiness of the hi tory compared to the extent of the disabil ity make this diagnosis very doubtful. Cer. tainly in this series except in the first case the diagno i was not seriou ly entertained Several other points help in establishing the likelihood of tinding a ruptured disc spine i often tender in the region of the dis turbed disc. Tenderness of the spine is n t con picuous in cases of innocent tumor of the cauda equina but in the case of malignant disease the pine i tender. The positive La serue sirn i quite helpful for it is uncomm n



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The patient made a good recovery form the operation fle hon pain and he can us his bladder but he can of will a like tith the anesthesia

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## LUNG ABSCESS

## An Analysis of 244 Cases

ANIBAL ROBERTO VALLE MD Ch 1 tt lle V mg n a

In this paper we attempt to analyze the more important features of 244 cases of lung abscess from the record of chest service. Barnes Ho pital and St. Louis Children's Hoopital St. Louis Vissouri during a period of 12 years from 193 to 1943 inclusive. In spite of the advances made im the treatment of other diseases of the chest the methods so far devised for the treatment of lung ab cess are not wholly satisfactory.

#### CLINICAL FEATURES

Differential diagnosis. The differential diagnosis between lun, absce s bronchine, enic car cinoma tuberculosis bronchiectasi inter lobar empyema and secondarily infected cyst of the lung is important. Tuberculosis can be ruled out by repeated sputume examinations for tubercle bacilli in direct smears concentrations culture and guineapig inoculations. In this distinction the onset of the disease is of consideration because tuberculosis seldom starts as an acute adment. The secretion from lung abscess is foamy watery brownish and foul smelling as a rule and that from tuberculosis is very thick, usually green and odorless.

To differentiate between simple lung ab cess and carcinoma is more difficult because often there is a combination of the two result me from an infection of the carcinoma. The x ray picture in bronchiogenic carcinoma often sho vs atelectasis of one lobe and a not well outlined shadow Some cases of carcinoma develop pleural fluid in which caremoma cells can be ditected. We believe that the best means of differentiating between the two is bronchoscopy which in the case of bronchiogenic carcinoma will generally reveal the growth blocking the bronchus from which a biopsy can be taken Sometimes the bronchus can be seen to be compressed from without

In a few cases the tumor may be out of reach of the bronchoscope and an accurate diagnosi cannot be made until an exploratory thora cotomy 1 performed

In cases of bronchiectasis complicated in lung absec s the long history and lipidol bronchograms are valuable in differential diagnosis

The distinction between interlobar empyema and lung absects can be made by the fact that in the early stages of the empyema the patient does not cough or brine up any sput um. If the empyema opens into the bronchial tree and drains through the bronchial tree and usually odorless sputtim. The r ray picture of empyema shows a well demarcated shadow located in a fissure area.

Diagnoss often can be made between in fected cy is of the lung and lung absces Usually there is more than one cyst in the lune and all of them are not infected. The infected cyst generally reveals on the x ray film a fauly sharp outline with thun wall as contrasted with the poorly defined outline of

the ordinary abscess Location It is generally believed that the majority of lun, abscesses are located in the lower lobes a belief borne out by the findings in our cases This opinion favors the aspira tion theory of the etiology of lung abscess From a review of the literature on lung abscess this belief seems justified even though in some series of cases it has been reported that the upper lobes were more often involved than the lower Cutler and Gross found the largest number of abscesses in the upper lobes and Flick and associates reported the same On the other hand Freedlander findmes states that the predominant sites are the apex of the lower lobe posteriorly and the lingula Lueth and Sutton point out that they found the greatest number of abscesses in the ri ht middle and lower lobes In our patients the

From Ches Servi Washingto Lin era to Medical School, Barnes Horpital, S. Loui Missouri right lower lobe was found the more common site of the abscess the next most common site being the left lower lobe followed in order by the right upper left upper and right middle lobes. Also included in this report are 6 cases of bilateral lung abscess

TABLE 1 —DISTRIBUTION OF ABSCESS IN GUR SERIES OF CASES

Loca on	N	Per ce
Left pperl be	9	7 S
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Left ppc dlow t	4	5
R ght ppe i be	37	5 7
Right I w I be	7	43 8
R ght m ddl	3	S 5
Right uppe dim ddl	- 4	S
Right low d m ddl	5	9
Rgbt m ddl dlft l e	3	3
Rghtl dlftlos	_3	3
T tal	44	

Etiology and pathogenesis For many years

there has been a great deal of discussion about the etiology of lung abscess. The opinion is divided as to whether it is produced by aspiration or by embolism Cutler and Gross and Schleuter and Weidlein in support of the embolie theory cite the difficulty in producing abscess experimentally through the bronchi They state that abscess occurs following local as well as general anesthesia and that in the majority of cases considerable time elapses between the operation and the development of the abscess. In their experiments with dogs they were able to produce abace ses consistently by using infected emboli. It is of inter e t that these abscesses healed quickly except when the emboli used were infected with pyorrhea scrapings in which cases chronic abscesses were formed containing anaerobic and aerobic organisms. Dogs however are not good animals in which to produce abscess through the I ronch; because of the horizontal position of the bronchial tree and the great resistance of the lung tissue to infection Nevertheless more or less constant results have been obtained by introducing pus from lung abscesses containing various organi ms such as pirochetes fusiform ba illi acrobic and an ier ibic cocci when su h material I locks the bronchus mechanically can ing an ar a of atelectatic tis ue with low resistance to infec

Occasionally in this manner chronic

abscess can be produced in the atelectatic area Dr Duff Allen made the important ex perimental observation that it is not necessary to block the bronchus if the pus from a human lung abscess is immediately introduced into the bronchial tree of the dog while it is still warm The organisms responsible for the pro duction of pulmonary abscess are apparently very susceptible to cooling Even if they are allowed to cool to room temperature they lose their ability to cause lung abscess in the dog unless the bronchus is simultaneously ob This important observation of Allen's once and for all clearly showed that aspiration of suitably infected material can produce a lung abscess even in the absence of an obstruction

It is the consensus that the difficulty in producing abscess via the tracheobronchial tree is due to the cough reflex and normal action of the cilia. This same is true in man and prot ably accounts for the infrequent development of lung abscess despite the frequent aspiration of infected material into the lungs.

Many authors support the aspiration theory by pointing out the increased frequency of occurrence of lung abscess following tonsillectomy and tooth extraction especially with highly infected gums and when ether anes thesia is used which increases the production of mucus and decreases the cough reflex. It is also emphasized that abscess occurs less frequently when the patient is head is kept lowered during the operation.

In our series we found that 41 lung ab scesses developed after tonsillectomy under ether anesthesia and 27 after abdominal oper ation under general anesthesia. Myerson sub pected to bronchoscopy a number of patients who had had tonsillectomies performed under gueral and local ane thesia and found blood and mucus in the lower bronchi in 90 per cent of the cases with general anesthesia but found it in a much lower percentage among those having local anesthesia and cough reflex present.

In 157 or 6, per cent of the cases in this serks lung abscess was said to have followed pneumonia. Although during pneumonia the bronchus or bronchi prohably become blocked by thick mucus which causes atelectasis in the plurged off area and thus initiates favor able conditions for the development of an abscess the tatement of the patient or even of his physician that the condition had its ori gin in an attack of pneumonia should be accepted with caution Every lung ab cess begins with a localized pneumonitis which often is considered to be a lobar pneumonia is stated by Fisher and Finney if virulent pricumococci are in the bronchial secretions lobar pneumonia will result but if anaerobic organisms of the mouth are pre ent a lung abscess or gangrene might result. As stated before normal lung tissue is hi hly resi tant to infection but atelectatic tissue is easily in fected This viewpoint is expressed by many writers in recent literature

Other causes of ab cess in our series were aspiration of foreign body subphrenic abscess congenital cystic disease encephalitis in a case and in 7 cases the cause was unknown

In our 36 cases of lung abscess amon, children 8 cases or 3 per cent were caused by aspiration of a foreign bods \ \text{one of the abscesses in our adult patients was caused by aspiration of a foreign bods.

TABLE II -CAUSES OF LUNG ABSCESS IN OUR

Bacteriology In our cases cultures were taken preoperativels from the sputum from material obtained by bronchoscopy and post operativels from material obtained directly from the ab cess It i difficult to determine the exact bacteria causing the ab cess be cause in most cases there is a combination of two or more types. Both aerobic and anaerobic bacterial are found in line ab cess cultures as are also facultative anaerobes. According to Varney aerobic organism first invade the bealth; ti ue and prepare the way for further damage by the anaerobic organism.

The flora found in lung absc s is remarkably similar to that found in the mouth e peculy in a mouth with infected gums

In our series pneumococci nere found in per cent of the cases Staphylococcus aureus in 18 per cent fusiform bacilli in 1, per cent hemolytic streptococci in 14 per cent Micrococcus catarrhals in 12 per cent and pinochetes in 5 per cent

D T Smith has found fusiform bacillia d prochetes associated with anaember streptococci and vibrones in the wall of the lurabscess and with that combination produced abscess experimentally in animals. Some writers consider that the pirochetes and fusiform bacilli are secondary invaders also that they are an important etiologic factor in the chronicity of the abscess and that they probably contribute to the foul odor of the sputum and had be nath.

Philip Varney mad a noteworthy study of the bacteriolo ic factors causing lung absces-He emphasize I the importance of searching for angerobic as 1 ell as aerobic organisms. In his series of cases he found Bacillus melaninogenicus in 04 per cent of the cases. He also found that the cultures of this organi m had the very foul characteristic odor of putrid lun abscess and that the strength of the odor in creased with the number of these organisms His finding show that the chief present organt ms concerned with this process are Bacillus melaninogenicus fusiform bacilli pirochete and streptococci especially of the viridans type. In the present series cultures for Bacillus melaninogenicus were not made

TABLE III —ORGANISMS FOUND IN CULTURES
MADE ON CAUFS IN OUR SERIFS

Orga in	p m
P eumococ	7
Staphylococ	4
f frm b il	7
If m lytic t eptococe	j.
Microcrecca t hal	
Sp och tes	5
SI ptococti	4
I fi nea b il	
0) 15	

Symploms and signs Almost athout exception court is present in all cases of lurabscess and i the earliest symptom usually being dry at first and becoming productive

later W first the putum is meager but in creases and often becomes foul as the abscess progresses. Many types of sputum are found in abscess patients odorless purulent sputum nucoid putum blood streaked and thin foamy brownish colored foul sputum. In our cases 88 6 per cent had foul sputum and 11 4 per cent had odorless sputum.

'Hemoptysis occurred in 578 per cent of our patients with lung abscess and these results are consistent with results of other writers. Thek and associates reported hemoptysis in 43 per cent of their patients. Warner in 54 per cent and Lisher and Funney in 20 to 40 per

cent of their patients

In about 90 pcr cent of our patients we found chills and fever present. Amety four per cent of the patients had chest pain of the pleunite type as an early symptom. This symptom is an important consideration in patients who are to have surgical drainage be cause this is sometimes an indication that the pleura is adherent in the absects region thus increasing the possibility of a one stage oper ation.

On r hysical examination we found in many cuses foul breath pyorrhea and dental carics duliness to percussion suppressed breath sounds and rales over the abscess area. The breath sounds varied from bronchovesicular or tubular to amphoric when the cavity was large superficial and empty. It is worths of note that some of our patients exhibited no pulmonary symptom Also it was observed that in some cases the symptoms varied from time to time for instance at one time there mi ht be chest symrtoms and on the next examination no symptoms at all. We found clubbing of the fingers and toes occurring more frequently in chronic cases than in acute cases With reference to the laboratory examina tions in acute and subacute cases we found frequent leucocytosi and in the chronic cases frequ nt anemia

If gas without saying that s ray examina to n is mig traint in the accurate localization of the abect s. It sufficient tim has elapsed since the ones of the trouble one may see that the x ray i ture has changed from that of an ill lefined area of pneumentits to one of happer demarcation and then to that of a

cavity with a visible fluid level. It is not advisable however in most cases to wait for this development to occur before treatment is instituted. Of course the localization of the abscess will be facilitated by the making of films in different positions. We find lipiodol of little use in localization of abscesses because it seldom enters the cavity itself.

Age and ser Of our 244 cases 268 were adults and 36 were children. The average age of the adult patients was 359 years and the ages of the children varied from a mouth to 13 years the greatest number of patients being between the years of 3 and 10. Of our cases

154 were male and 90 were female

Duration of disease. The duration of disease in our cases ranged from 3 weeks to 19 years. In this report we have considered as acute cases there of no more than 2 months duration. All cases lasting more than 2 months we have considered as chrome the average duration being 1 year. We present 110 acute cases of which 63 patients had surgery and 47 had no treatment other than bronchoscopy and 134 chrome cases of which 101 patients had surgery and 33 had nothing except bronchoscopy.

#### TREATMENT

Prophylaxis I rophylaxis is of great importance in any discussion of lung ab cess. Good care of the teeth gums and throat is impera tive before any contemplated operation especually one of the upper re puratory tract. It is also important in operations in which deep and prolonged mesthesia s n cessars which case the production of mucus is in crease I and the cough reflex is diminished sufficiently to permit aspiration into the smaller bronch Sometimes the material aspirated in this manner is thick enough to plug the bronchi thus causing atelectasis or is infected with our producing cells from the mouth or other organisms from the upper respiratory tract causing secondary infection

strong sedatives should not be used before and after operation be ause they decrease the ough reflex and facilitate the retention of the

Creation in the lower bronchi

One of the mo t important steps in post operative p ophylaxis is the frequent aspira

tion of the bronchial secretions and vomitus if present in the trachea by nasal catheter Inhalation of oxygen and encouraging the patient to cough after operation are two other prophylactic measures

Medical treatment Nonsurgical method of treating lung abscess except broachoscopic aspiration have been largely discarded be cause they are meffective and because they lead to delay in the performance of surgical dramage Some abscesses however become healed spontaneously by breaking into a bronchus and thereby accomplishing the same effective drainage which the surgeon aims to create by external drainage. But this fortunate result is not to be expected. In general a lung abscess that seems not to be draining itself adequately through a bronchus should have external dramage as soon as the dia\_nosis has been established. Neuhof's writings on this subject which will be discussed more extensively later have had great influence in changing our conceptions. It is always possible of course that some specific agent against the infecting organisms may be discovered which will reduce the necessity of surgical interference But apparently that agent is not yet at hand Penicillin seems to be helpful in some cases but not in most

In all our long abscess cases postural drain age was given a fair traal as treatment evcept in those cases with abscesses located in the upper lobes. We start the patient on postural drainage for 5 minutes and increase the time gradually to 30 minutes. The patient is put on a pecially built postural drainage table from two to tbree times daily with the table titled to a 45 degree angle. We encourage the patient to cough and expectorate during these periods. Sometimes this procedure coupled with bronchescopy cures the abscess without suggest intervention.

Branchoscopy Most of our bronchoscopies are performed under avertin anesthesia ad ministered rectally 8, milligrams per Lilogram of body weight. In poor risk patients or patients with severe heart conditions we use local anesthesia pontocaine per cent

Of our patients 92 per cent have had either one or more bronchoscopies. We consider this one of the roost important feature in the diagnosis and treatment of lung ab ce has patients treated only by bronchoscopy 4 were improved

As a diagnostic procedure it is very useful localization of the abscess by reveal which bronchus is the source of the pus It is invaluable in making a differential diagnoss between a simple lung abscess and one as one ated with a carcinoma. In our experience as occasional patient exhibits the symptoms of a lung abscess which is only a complication of a bronchizegenic carcinoma. The tumor block the bronchus and causes an area of atelectass followed by a lung abscess the symptoms of which predominate. On bronchizecopy the tumor is revealed and changes entirely the aspect of the treatment of the case.

As a part of the treatment bronchoscopy is much used Sometimes the draining bronchus becomes plugged and by introducing the flexible suction tip into the bronchus the mucus plug is removed and drainage promoted As before mentioned it i used as a means of keeping the bronchi open to lacili tate postural dramage. We do cauterization through the bronchoscope to remove the granulation tissue which sometimes forms and blocks the bronchus This procedure also aids in draining the abscess through the bronch Patients in bad condition can often be so greatly improved by several bronchoscopic aspirations that the later surgical drainage becomes less hazardous

We consider bronchoscopy imperative when ever aspiration of a foreign body into the bronchial tree is suspected

Neuhof and Touroff Surgical t eatment have su gested early one stage surgical drain age in acute lung abscess considering as acute abscesses of not more than 6 yeeks duration from time of onset of first symptoms basis for the soundness of this suggestion they state that from observations at operations and autopsies the lung abscess cavity exists within I week or 10 days of the onset of infec The lesion is usually superficially located in the lobe and adhesions levelop very early in the disease which facts make possible a one stage operation \t early operation they state they find a solitary unifocular lesion as-ociated with walling off pleural adhesions

By early operation the possible complications of spread of infection by spill-over fibrosis of surrounding pulmonary parenchyma formation of multilocular cavities and bronchies tass are avoided. Also there is less chance of development of metastatic abscesses in other parts of the body particularly in the brain and amyloidous. The results obtained by them justify their recommendation of early operation since they report a series of 122 operations for acute lung abscess with a mortality rate of 3 27 per cent.

The majority of our patients had reached the chronic stage when they came to us for We have found that external treatment dramage of the abscess is the most effective surgical treatment for lung abscess. In this treatment accurate localization of the abscess is an important factor to ascertain the point where the abscess is closest to the parietal pleura which determines the approach. When the site of operation is decided an incision varying from 10 to 15 centimeters in length is made along the ribs to be resected. We resect as a rule two ribs subperiosteally in about to centimeter lengths. The position of the pa tient on the operating table depends upon the side to be operated upon and the localization of the abscess The majority of our patients were operated upon in the horizontal position with the side to be operated upon uppermost In patients in whom we expect to find several bronchial fistulas we place the patient in a semi sitting position to keep the secretions in the lower bronchi during the operation and from plugging the major bronchi to present suffocation

We use general anesthesia in all cases but at times use avertin as an induction anesthesia. We use either nitrous oxide or intravenous pentothal

In this series we used the actual cautery to unroot the abscess cavity. This procedure was carried out in one or two stages depending upon whether or not the lung was adherent to the parietal pleura. It removal of a section of the rib overlying the abscess it can be readily seen whether or not the lung i adherent to the parietal pleura or moves freely benesth it. In cross in which the pleura is not adherent the operation must be done in two

stages In our series we found a two stage operation necessary in 50 per cent of the cases At the first stage we pack the rib beds with either acrifiavine or iodoform gauze to create adhesions. We allow the pack to remain in place without changing from 10 days to 2 weeks.

When the pleura is found adherent we use needle a piration in order more accurately to determine the real position of the abscess after which by means of cautery the abscess cav ity is widely unroofed. All necrotic tissue and ous are aspirated by suction. After it is un roofed the cavity is tightly packed with acriflavine gauge and then a dry dressing is tightly applied. We let the pack stay in place from 4 to 3 days at which time it is changed under general anesthesia intravenous sodium pentothal The second change of the pack can be made under morphine hypodermically without too much discomfort to the patient Thereafter the pack is changed every other day and packed more loosely in order to give the lung a chance to re expand

When the aliseess is located near the periphery of the lung and is open into the periphery of the lung and is open must oblight and the periphery of the lung and is open into the location of the lung and is open into the death of the lung and is open in the lung and lung

TABLE IN —TYPES OF OPERATIONS PERFORMED
AND THE NUMBER OF CASES HAVING EACH

We do lobectomy for lung abscess in cases in which the cavity does not heal completely and the I ronchopleural fistulas are still present 6 months or more after the cautery opera

tion is performed. If however any active infection is present lobectomy i a dangerous operation In this series 28 cases of lobectoms for lung abscess are included. The lobectomy is performed under cyclopropane intratracheal anesthesia with the patient in the borizontal position with the side to be operated upon uppermost We never start the operation until 5 per cent glucose in saline or distilled water is running intravenously. Shortly after the operation begins we start blood transfu sion. In the average case the patient is given routinely a transfusion of 500 to 1000 cubic centimeters of whole blood. The postero lateral incision is used and the 6th rib removed subperiosteally. In chronic lung abscess cases because of the many adhesions and the pres ence of scar tissue the dissection of the hilar structures is either so difficult or impossible in some cases that mass ligation of the hilus is the only safe procedure. Of the 28 lobectomies reviewed in this series we used individual ligation in only 7 cases. We routinely drain these patients with two rib resection drainages one in the posterior axillary line through the 7th or 8th rib and one in the mammillary line through the 6th or 7th rib We keep this pro cedure as a closed drainage from 10 days to weeks and then use open drainage. In patients with lung abscess and secondary bron chiectasis with copious bronchial secretions bronchoscopy is carried out before and after the operation

We also have 2 total pneumonectomies for lung abscess in this series in which there were multiple abscesses involving the entire lung Postoperati e complications One of the

most serious postoperative complications in lung abscess is hemorrhage. The use of the cautery makes hemorrhage less likely to occur and we found that tightly packing the open ing after the operation helps to prevent hem orthage in many cases

Occasionally a complication i caused by sometimes this has caused involvement of the opposite side blocking the bronchus and spreading the dieses. This mishap can be avoided by frequent aspiration of secretions and encouraging the patient to cough during the early po toperative period.

Whenever the ab cess is close to the perer, and the cavity ruptures into the perpace and bronchopleural fi tulas are preemprema occurs. We found in our sense is, case of preoperative emprema—is a peroperative complication it is a rate occurs or because we exercise much care to see that adhesions are present before dramage is at tempted. When the emprema occurs the patient usually develops an anaerobic infetion of the pleural cavity which requires atquate dramage and changes the pro-no-is fi the case for the worse.

Another complication worthy of considers toon 1 septice spread of the disease to othe parts of the bod. These abscesses exhibit he same type of put the same odor and the same type of put the same odor and the same type of put the same odor with the same type of the same type of

Brain complications Sixteen or 5 per cent of the cases had brain complications have vere proved brain absess cases 4 with doubtful and 3 had cerebral embolisms. In only 1 case was an operation for the bra abscess performed and this was unsuccess? In r case the lung abscess followed a cramotomy.

In many of our cases bronchopleurocutam ous fistulas were present after operation Often they close spontaneously but when they re main for long periods of time they require lobectomy plastic operation such as muscle graft or Schede thoracoplasty

RESULTS
TABLE V — RESULT OBTAINED IN
OUR PATIENTS

It is very difficult to state just what type of treatment is best for lung al seess because there are so many variable factors to be considered in each case. The success of the treatment depend up in the duration if the heave prior to operation, the patient significant time the ethology of the disease, the bacteriorical flora and the location of the abscess.

In our series 164 patients had surgical treat ment and so patients had no surgical treat ment. Of the patients treated by bronchos copy only 61 per cent were improved and the mortality rate was 20 per cent. In those hav ing surgery 62 per cent were improved and the mortality rate was 38 8 per cent. In the series as a whole the over all mortality rate was 27 per cent with 73 per cent of the patients payorom,

#### SUMMARY AND CONCLUSIONS

In the paper we have presented a review of 144 cases of lung abscess some of which were reated surgically and some nonsurgically We make no attempt to prescribe any definite nethod of treatment for lung abscess but in hese conclusions present some facts found n our series of cases which we consider vorthy of note

A precise localization of the abscess is very important in determining the method of approach in cases in which surgery is contemplated \ ray examination and bronchoscopy are particularly useful in this respect. In our series the most prevalent site of the abscess was the right lower lobe the next the left lower lobe and the next the right upper lobe

2 Forty one abscesses developed after ton sillectomies and 27 after abdominal opera tions all performed under general anesthesia and most of them under ether. In 23 per cent of our cases in children lung abscess wa caused hy aspiration of a foreign body

3 In cultures of sputum material obtained by bronchoscopic aspiration and the material from the ab cess itself we found both aerobic and anaerobic organisms. I neumococci were most frequently found and less often Staphy lococcus aureus fusiform bacilli hemolytic streptococci micrococcus catarrhalis etc

4 In regar I to symptomatology we found the earliest and most frequent symptom was cough dry at first and later becoming productive Of our patients 88 6 per cent had foul putum 11 4 per cent hal a Jorless Fu tum and 578 per cent had hemoptysis Chills and fever were found in 90 per cent of the cases and the t pain in 94 per cent

5 In the cases reviewed 134 were male and 90 female 208 adult and 36 childr n The

average age of the adult patients was 35 9 years and the children ranged between a month and 13 years

o The average duration of the disease in these cases presented was a year. This factor 1 to be considered when the type of treatment

to be prescribed is selected

7 We consider the following as possible preventives of lung abscess following surgery (a) good care of teeth gums and throat before a contemplated operation (b) avoidance of the use of strong sedatives before and after operation because they decrease the cough reflex (c) frequent aspiration of the trachea and bronchial tree by nasal catheter (d) the encouraging of the patient to cough after operation (e) early aspiration bronchoscopy in a postoperative atelectasis

8 In acute cases the abscess should have surgical drainage as soon as it is diagnosed

o In some chronic cases we try conserva tive treatment first and if the patient does not improve sufficiently with this treatment

operation is performed

10 We create surgical drainage by several depending on the location of the abscess In cases of peripheral abscess with empyema a thoracostomy is performed with additional enlargement of the opening in the lung by cautery il necessary. We performed 37 thoracostomies for associated empyema in cases with more deeply situated abscisses the cautery procedure described in the text was carried out totally unroofing the cavity with resection of the overlying ribs. This procedure is performed in one or two stages de nendin, on whether or not the pleura is adherent When done in two stage an inter val of from to days to 2 weeks is allowed to elapse between stages. In all surgical proce dures we use general anesthesia a piration is helpful in accurate localization of the abscess after the pleura is exposed. We allow the pack to remain in the abscess cavity for about 3 days changing it the first time under general anesthesia Thereafter the pack is changed every other day and applied more loosely to allow the lung to re-expand

In some cases in which the cavity does not heal completely and bronchial fistulas remain over a considerable period of time we perform a lobectomy. There are 8 lobectomies in this series and the fall incum nectomic

11 The po toperative complications that we encountered were hemorrhage 1 ill-over empyema sentic pread of the disease myol ing the subcutaneou ti ues of the bods kid ney spleen and brain Bronchopleurocuta neous fistulas sometimes require plastic oper ation Schede thoracoplasts or lobectoms for obliteration

#### REFFRE\CES

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## VOLVULUS OF THE SIGMOID COLON

## Report of Twenty five Cases

## WILLIAM D GRIFFIN MD GEORGF R BARTRON MD and KARLA MEYER MD FACS Cheag III

IN the United States volvulus of the sig moid colon is so uncommon that few series are large enough to evaluate ade - quately the clinical picture diagnosis and therapy of this condition This is not true in Eastern Europe for of 215 cases of intestinal obstruction reported by Pearlman from a Russian clinic 111 or more than half were cases of volvulus. Of 10 cases seen at the Friedrichshain Hospital in Berlin Braun and Wortman list 31 cases of volvulus of the sigmoid colon At the Cook County Hospital 458 cases of large bowel obstruction were treated between 1937 and 1945 Thirty seven of these cases were volvulus of the sigmoid colon at an incidence of 8 o per cent These eases comprised 2 2 per cent of all intestinal obstructions admitted The clinical and sur gical records and the x ray films in 25 of these cases of established volvulus of the sigmoid in which all the data were complete have been reviewed and constitute the basis of this report ANALYSIS OF CASES

Table I gives the age distribution of sex and symptoms in 25 cases of volvulus of the sigmoid colon. The following observations were made 14 cases or 56 per cent were con f ned to the age group of 51 to 70 years The sex is usually reported as predominately male and our series agrees showing an incidence of 16 males and 9 females Although volvulus has been decided into 3 groups by Fernstrom our cases fit better into two general types acute and subacute Seven patients of the acute type or 28 per cent which occurred in the younger age groups had an onset that is hort in duration usually about 4 hours with no hi tory of previous attacks and an

From h II ktoe 1 st. f Med cal Research and th De-pa men f urgery ith Cook Cu. y Hos; l ith Cook (out t ) School of 31 i

equivocal history of constipation. All these patients experienced early emesis of a tran sient nature and generalized cramping ab dominal pain Eighteen patients of the sub acute type or 72 per cent showed a different picture in that the condition occurred in the older age groups had a more gradual onset of symptoms with an average duration of 102 hours and consistently presented a history of previous attacks chronic constipation emesis late in the course of the disease and cramping lower abdominal pain

In Table II the physical findings are sum marized in both the acute and subacute types of volvulus Half of the acute type showed distention audible peristalsis minimal abdom anal tenderness and ability to take amounts of enema up to 1000 cubic centimeters. The Tray films in these patients indicated disten tion of the sigmoid due to volvulus and lana rotomy revealed a sigmoid volvulus with viable bowel. The remainder of the acute type had severe distention absence of peristaltic sounds abdominal tenderness and the mabil ity to take more than a 500 cubic centimeter cnema The flat film of the abdomen or the barium enema revealed a pattern indicative of volvulus of the sigmoid Laparotomy con firmed these findings and showed in addition a gangrenous loop of bowel. The 2 deaths which occurred in the acute type had de veloped a gangrenous segment

All the cases of the subacute type of sigmoid volvulus were characterized by severe abdom mal distention Marked tympany and audible or visible peristalsis were also absent \bdom mal tenderness was a variable finding. The enema test was for the most part consistent in that 76 per cent of the patients were unable to take more than a 500 cubic centimeter tap water enema introduced under the force of gravity The patients who were able to take

### TABLE I -SYMPTOMS ACCORDING TO ACE DISTRIBUTION

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more than 500 cubic centimeters were in the class of incomplete volvulus and the enema return was always incomplete as some of the solution was caught in the twi ted loop. It was seldom necessary to use the barrum enema to make the diagnosis However in those few cases in which on examination of the gas pattern on the flat film of the abdomen doubt

TABLE II -PHYSICAL FINDINGS IN TWENTY FIVE CASES OF VOLVULUS OF SIGMOID

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Enema k cube ce m rs			~
90 more		ii	21
000 more			
Year eval ace do film			80
ba um pem			~
Gangrene			13
hubl bowel			

still ext ted as to the diagno is the pattern of the barrum enema was concluite Gangrere was present in half of the cases of the subacute type The mortality rate was 50 per cent but was unrelated to the gangrene sin e an equal number succumbed with a vable bowel as with a gan renous bowel. The over all mortality for both types was 40 per cent

The acute type follo is the course of a ful minating lesion and there i the same marked prostration that is associated with volvulus elsewhere in the gastrointestinal tract Be cause all of these patients have early tran iert emesis cramping abdominal pain with tender ness in all the quadrants of the abdomen and some fever their symptoms may be mistaken for an inflammatory intra abdominal less n The following case is cited as representative of this type

ha perf tl ll lrdfml Il tl8h rs pri t dm 1 br kf t 5h hal will add th mlb lm met dwttwk 1193 crmp g bim al am h w d th ta a m 5 nth lft d Sh Th mps th what h had eat e I d lth ghthywr les Th fires tm lcat m h took m panth becam q t re 1th pat tw bm dptt bed \t copm h brz mt claf thym tualth thd dic take b m B 600 pm th pa h lbe m p pret dth pat ticiit gite ho-p tal



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In contra t to the acute fulnmenting type of k 10 of critical then, 1 the more commonly sen type of 1 most volvulu which w have cell I said acute. The great maponty of these prin airs were amil ulant through ut the course. It h becase de jit the trumendous di ten in fiberal al lomen and a complaint of only m heate liscomfort. The jint om are at it attacks of justial ob truction of the c lon.



fg & tht [1] Pth thid Bht tdl[deslftfithgmldt] dillthiltht that flthedlytt ttthlttockttfth

Obstigation for a day is followed by a distincted ablomen and ga pains below the navel relieved by flatus. The tendiney is for the attacks to become more frequent until complete obstruction and the patient to the physician (12). The following case illustrates this subacute type of sigmont obvium.

C D 11 col cl man 53 amilul tetit b adm ttelt th h it I g mplit Sh sttdthat8 ul hentelaceme g biminal mod at air anil cated up apub cally ablm n Sh t L ome mine al tf t If Th pah ntnel t mtt tl alut hu ftrthith t pp. 1 3nh It the pin curred the trade the t The pa am chth litit gitnit reugbt ot 3 mnt all t g bot m uto The panth n t 1 th gh t th (nt ! 1 lm n and bot 5 hurs ft r th n t f th path t ntn todth th bim il 2 nts f hurs aft th th jat at hala ho I m ment p am ntiis int Th t t



TABLE III -OPERATIVE RESULTS IN CASES OF

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attempted to correlate the surgical procedure and its sequelae I i ht patients were treated by a Mikulicz (11) procedure Of these 6 were treated by this method as the initial proculum. One patient had a recostomy 15 days previou ly and a patient had a simple detorsion then a recurrent attack and a lateral ana tomosi and on the third recurrence an exteriorization and resection of the markedly redundant sigmoid loop. Three patients expired and in all 3 gangrenous bowel was no sent

Six patients were treated by simple detor in with i death. Of these 3 patients had re urrent attack a of which was relieved by e nservative therapy i by a lateral anasto me 1 between the proximal and distal sig mıl lxqs patient vas not relieved by enservative therapy and expired

live patients were treated by a Rankin tru tive reaction (14) with a fatal out

In 4 patients the diagnosis of large bowel I tru tion was mad and they were treated



gm d mpl t

by a Mc lealy recostomy (10) They did not re pond to this therapy Two patients died and of the 2 who survived cecostomy one required a Rankin obstructive resection 24 hours later for gangrenous bowel and the other was partly relieved by the cecostomy only to become completely obstructed re quiring an exteriorization procedure 15 days later

Two patients were treated by conservative method of oil and chema routine in the knee chest position because they refused operation One of these recovered but he had a recur rence of he volvulus 2 years later and expired

One of the most significant findings in thi review of the operative and nonoperative ther apy of volvulus of the sigmoid colon 1 that volvulus is a lesion with a marked tendency to recur doing so in 20 per cent of the case and necessitating further operative proce dures and being as ociated with a mortality of 40 per cent



Fg 6 I di beut set f h d u
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m d lop h hoe pes th u bd m l i
Ar m k th po t f th l 1;

Since volvulus takes place by rotation of the loop around its mesenteric axis it requires of course a mobile loop of si moid (9) Truves considers chronic constipation an im portant etiological factor. All writers stress the increased length of the intestinal loop involved and many attach significance to a vegetable diet among the Russian and Sibe man people. In our series there was no incidence of venetable dietary abnormalitie Rather we found that there was a constant finding of chronic con tipation and cathartic habit These factors could produce hyper trophy of the sigmoid colon in len\_th breadth and thickn's while the mesenteric base re mained the same Such condition mucht pr di.po-e to volvulu Brehm observed an abnormally long sigmoid flexure to be more frequent in male than in females Another po ible explanation of the difference in sex frequency offered by Wangen teen (8) 1 that the more relaxed abdominal wall and roomier palvi in the female i more apt to favor pontaneou reportion if a twit or uns other ctuol giral fact is a hinh with two observed at Tipanotoms in land if a fillian on either con unital or lu to an (11 pen tomit or du to previou attack of volvulu with hemorrhage into the mesinters and heal in, with sear formation cau in a secondary contraction of the base of the misutery.

Blood good give an intere ting and mason able explanation of the mechani m of vel ulus He believes that a di tal colon di tended habitually with faces will develop a thickenin, of its wall. The phenomenon can be verified in re-ected specimens. The moid vall 1 found to be thickened up to 1 centimeter in spite of a tremendous amount of acute de tention. The base of the me enters in such case a relatively narrow and the condition is spoken of a a contracting me n This contraction draws the bac of the me-entery of the proximal and di tal por tions of the sigmoid to ether thus enablin it to be more easily two ted Constinution and fermentation with the formation of gas and the consequent di tention lifts the sigmoid loop up into the abdominal cavity and as the proximal si moid dilates it become more tense because of its fixed attachment with the descending colon Meanwhile the lower por tion of the sigmoid and the upper part of the rectum which are less fixed ri e and as the least reatance a to the left the datended lower portion of the sigmoid and rectum move in that direction. The upper portion of the simmoid moves down to the right and the volvulus i produced vath a clockwist mesen teric twi t Such twist was found to be preent in the 6 case of which a record of the direction of the volvulus was kept since in to other cases the direction was n t noted the evidence i still inconclusive

The greatest incidence of volvulus of the sigmoid colon occur in middle and advanced years. In 119 case collected in the European Interature Giffhorn observed the following ago distribution. Of 108 cases of volvulu of the sigmoid 46 cases were in the a e group of 31 to 39 sear and 40 cases were in the age group of 31 to 10 years.

Determination of the capacity of the colon his the use of a tap water enema has lon lie in considered as a sign of diagnostic importance in mechanical obstruction of the large bowel The normal capacity of the colon in an unob structed adult is usually 2 to 3 liters of water The mability to introduce 500 cubic cents meters of water points to the presence of sig moid volvulus (17) This diagnostic finding was present in the majority of cases, but when the volvulus of the sigmoid is incomplete 3 liters of water may be introduced into the redundant loop. However it has been our experience that when this occurs the patient can exix lonly a small portion of this amount Since only 24 per cent of the patients showed this valve like action at cannot be regarded as a pathognomonic findings as has been claimed by some authors

Tenesmus and bloody mucus in the rectum have been reported as not being infrequent but was present in only 1 of our cases

Of great diagnostic significance is both the flat v ray film of the abdomen and that following the use of barium enema. We wish to call special attention to the rather typical gas pattern of sigmoid volvulus as is demonstrated in Figures 1 2 and 7 In all these cases which vary in duration from 24 hours to 5 days it is quite evident that the tremendously dilated sigmoid loop is situated in the right side of the abdomen and there is moderate distention of the colon beyond it These findings are classical roentgenographic evidence of sigmoid vol vulu (8) Rigler and Lip chultz state that the diagno 1 of sigmoid volvulus 1 made by the demonstration of a double point of obstruction the size and position of the sigmoid loop and the presence of unusual amounts of fluid From the evidence of the roentgeno grams in our own series the presence of an unusual amount of fluid appear to be an atypical and coincidental finding. Even in th se cases in which there was neglect in treat ment for 4 and 5 days no x ray exidence of an abnormal amount of fluid within the bowel was found

ligures and 7 demonstrate that vival material arrum enum riveal a normal mucosal pattern in the sigmoid and rectum di tal to the dilated loop. The upper end of the pacits however comes to a sharp point and produces the appearance of an aree of



Fig. 7 \ t tf8h d t B m
m lih fpdesppe fih g
m d l d lmdtltih lul \ tth
obth bpttm t fih fligdfias d td
byth m w

spades (7) The only lesson that may simulate this preture is obstruction due to tumors but in these cases there is usually a ragical stenois coevistent with the lesion. Thus from the examination of the flat v ray films of the abdomen and in doubtful cases of the films following a barum enema the diagnosis of sigmoid volvulus may be made with a reason able degree of assurance.

Treatment of these pattents on the general surgical service at thin the pital has been as sociated with a mortality of 40 per cent Perthes reports a mortality of 39 per cent and Pearlman reported a mortality of 46 per cent Methens in his study of the problem recommends the routine conservative use of enema to relieve the obstruction but admonishes that this hould not be persisted in too long. The sign of ditorsion are the passage of large amounts of feces and flatus but this detorsion gives no assurance that the volvulus will not recur. Simple untiwisting of the volvulus by this method or by surgical intervition has

been found to be madequate because the un derlying pathological condition has not been affected Attempts to perform a lateral anas tomo is in the pre ence of an unprepared di tended bowel have been admittedly oute unsuccessful even thou h these patients may be completely decompressed at the time of surgery by the routin use of two rectal tubes which are threaded up into the redundant ug moid and attached to a suction apparatus Our data indicate that an exteriorization pro cedure executed in the pre ence of a viable bowel gives the best recovery rate. If a "an grenous bowel is present resection is oblicatory but ey n in the eases of mable bowel secondary re extion following the exterioriza tion procedure seemed to be the on ration of choice SUMMARY AND CONCLUSION

1 There are two main types of sigmoid volvulus

Acute (7 cases) characterized by occur rence in the vounger age groups short onset equivocal history of constipation early tran sient emesis generalized cramping abdominal pains abdominal tenderness acute distention and marked prostration. These patients tend to develop eangrene early and run a fulliminating course.

Sul neute (18 cases) characterized by occurrence in the older age groups of a more gradual onset of symptoms in ton of previous attacks and constipation and emessis late in the course of the disease. The e-patients tend to develop gangrene slowly and run a more, moderate course

more moderate course
Seventy six per cent of the patients were
unable to take an enema of more than 500
cubic centimeters

3 The ingle most helpful aid was x ray examination. The typical reentgero rap he findings are trainendously dilated si mail loop situated in the right abdomen mod rate distention of the colon above the volvelus absence of a collection of fluid within the bowel ace of pades appearance of the barium enema opacity, normal mucosal pat term in the sigmoid and rectum di tal to the dilated loop.

4 Volvulus of the si moid tends to recur
and therefore imple detorsion is not the
treatment of choice

5 Exteriorization and second sta i resection give the best results

## RLFI RFNCES

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## THE SIGNIFICANCE OF TUMOR CELIS IN SEROUS EFFUSIONS

ALVIN H HONIGMAN BS MD Baltim M vl nd

TffE study of the physical chemical bacteriological and cytological char acteristics of fluids obtained from body cavities has fong been recog nized as a valuable diagnostic procedure Many times clinicians ignore another diagnos tic examination which may be carried out on aspirated fluids. This is the study of sediments from fluids for malignant cells results of examining effusions in the following reported cases emphasize the importance of this procedure as a diagnostic aid and prog no tic guide

The identification of neoplastic celfs in exu dates has been attempted for many years Zemansky cited Beale as the first to recognize carcinoma cells in exudates. Beale in 1860 found malignant cells in sputum from a case of carcinoma of the pharynt In 187, Quincke published the first study on cell in smears made from peritoneal and pleural fluids From that time on the literature has contained reports of numerous series of cales in which stained smears were examined for tumor cells /emansky has published an excellent review of the work and the reader is referred to his article for a review of this literature

The earlier reports were based on smears made directly from the body fluids Bahren burg in 180, was the first to use sections of st liment remaining after decantation of su exmatant fluid Mandlebaum described a simple technique of u ing sediment after cen trifuging the original fluid Several modifica tions of the method have since been devel ped. The advantages of sectioned sediment are that the cells may be studied in a natural relation hip one to another and that the chance of inding small group of epithelial

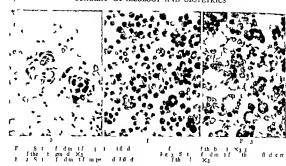
of direct smears. The appearance of cell groups is important since identification of car cinoma from individual neoplastic cells is most difficult A large amount of fluid should al ways la used if available There are occasions when only a few cells or groups of cells are present and the more fluid used the greater is the chance of observing them However typical carcinoma cells may be found in only a few cubic centimeters of fluid The technique used in making the histologic

cells in tissue sections is greater than in study

cal preparations presented here is simple and follows the method of Mandlebaum fluid is allowed to settle by gravity by stand ing overnight in the icebox. The clear upper layer is poured off and the cloudy sediment is centrifuged at 3000 revolutions per minute in a wide tube measuring 3 hy 7 centimeters for a 20 minute period. The supernatant fluid is decanted and 10 per cent formaldehyde added to the sediment. This mixture is allowed to stand for 18 to 24 hours when the formalde hade is poured off. By this time the sediment has hardened and the resultant button can be gently removed with a small scalpel effort is made to remove the ediment in as nearly one piece as possible. It is then run through acetone alcohol and chloroform par affin embedded in paraffin sectioned and stained with hematoxylin and cosin

Examination of the smears There are varied views as to the criteria on which a diagnosis of malignant growth can be made. Some investi gators base a diagnosis of carcinoma on the appearance of individual cells Emphasis is placed on such characteristics as the presence of mitotic figures variations in the nuclei and the presence or absence of vacuoles Foot and Quensel have stated that the diameters of the nucleolus and the nucleus are important and that the nucleolus nucleus ratio i high in ma lignant cells Zemansky reported that the presence of mitotic figures is pathognomonic

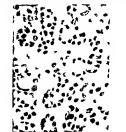
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of caranoma. However Karp and Foot have shown mutotic figures in mesothelial cell Zeman k3 criteria for the recognition of tu mor cells are the finding of fragments of tissue with definite arrangement of the cells in acinar or papillary formation the pre-ence of multiple group of lare deeply staning cell and the inding of fine ellular changes such as eccentric nuclei or mutotic figures. Foot found

acmi or papillae in 15 per cent of his case m taplasa m 43, per cent mitosis in 46 per cent and multinucleation in 65 per cent. The diagnosis of neoplasm may be confused by the diagnosis of neoplasm may be confused by the presence of mesothelial pleural pericardial and peritoneal covering cells. Schlesin er in a study of fluid taken from too patients made a diagnosis of carcinoma only after finding groups of cells who e arran ement left no doubt as to their epithelial nature.

In the cases here reported the diagnosi of carcinoma was ba ed primarily on the findin s of tumor cell arranged in p eudoacini ro



F 4 Set fedm tf mpe t 1fl d ppl 1 Set fed m 1th rsix X3



F Set fedim tf mp t lft

settes or papillae. In a few cases cells were found in cord or in solid groups and the variation in size shape and chromaticity was such that the diagnosis of malignant neo plasm could be made without reservation Several illustrative case with accompanying photomicrographs are presented

1 67 year ld white m le phys cian w s admitted to the University Hospital beca se of ankle ed ma abdominal st lling and p in n the right a m A paracentes: h d been perf rmed the day before admiss on and the p eadmiss on d agnosi as portal c rrhosis On the day f admis ion the patient uffered a spontan ous f acture of the right Exam nation on admission revealed marked pitting edema of the lo er extremities dyspine abdominal swilling cripitation around the right upper arm and cvid nee of picural effu sion Carcinoma was then suspected and confirmed hy finding t mor cells n secti ns f sediment f om the abdominal flud. The pat ent d cd a few days afte admiss on Postmort m exam nation was per mitted and a adenocarcinoma of the rectosigmoid was f und with metastases to the peritoneum and pl urae

The action (Fig. 1) sh ws two groups of cells These cells are arrang d in ir egular sol d groups The cells vary in size shape and chromaticity. All tho gh the section represented does not show mito sa too de iv ther seet in s.p. c. ented numero s

m t tic figures

CASE 2" A 42 year old white female as admitted because of recurr nt attacks of pper ahodomial pa nausea nd vomiting of 6 weeks d rat n The patient h d a r dical mastectomy for adenoca canoma of the h cast 13½ years bef c admission Adstancide ahodomen moderate dyspens and light a did a cealargement we cfound on examination. A fiw days after admiss in the patient developed a part of the period till than was don and a 30 cm of the period of the patient developed a part of the period till than was don and a 30 cm of the period of the patient developed a saft ray rid the patient ded and permission for unopy was not granted. The diagnosis fin tastate ca ca ma was made in the mation of 5 th ment from the period aff all ud.

The sect n (Fig. 3) shows nume ous red blood cells lymphocytes m oneytes nd isolated mesothel leell. Ther re pe sit may clumps of atty neight his lells arrang of m ps und can and rosties. The cll varv in it, shape a d cho mattest and ceasonal mitotic figures can be seen. The cell are rie g la by le cells the annar group-

1 ET CASE 3 A 66 y ar old femal e tered the Unit ty Hosp tal beca se f loss of weight anorexia and constitute of 1 m inth d rath A gastrotestinal series in de in a th hosp tal d mon trat d a poss ble pripire les in Examination

revealed a tender mass in the left lower abdomen and evidence of fluid in the right pleural cavity. A thoracentesis was performed and mal gnant cells were found in the fluid. The patient was discharged with the diagnosis of mope able on cinoma of the colon.

The section represented in F gure 3 presents numer us large pyknotic epithelial cells arranged in actin and tosetters. The actinal form tions vary considerably in ize. The epithel al cells are inconstant in size shape chomaticity and are i regularly placed in the actinary of These sections are com-

pat bl with carcinoma of the colon

Case 4 A 55 year old white female v as admitted because of dyspuea ascites nausea vomiting and lo s of wight These symptoms appeared after the patie t had be n discharged f om the hospital 2 months previously The discharg diagnosis was lymphogranuloma ascites and pleural effusion the latter of undetermined etiology. An abdominal paracentesis had been performed but the fluid was not e am n d for cells Eight years before the in tial the patient had undergone a b lateral salpingo-oophorectomy and hysterectomy This as done in another hospital and the reports on the sur gical specimens could not be obtained. At the time of the latest admission dyspnea abdominal distention ma ked pitting edema of the lower extrem ties and bilate 1 pl ral eff sion were found. An ab dominal paraeentesis and a thoracentesis were per formed and ad nocaremoma was found on the examinat ns of both fluids The patient expired after a rapid downhill course At autopsy a rectal st ic ture with gran loma and papillary adenoca cinomatosis with picural and peritoneal metastascs were found The site of the original mal gnant les on was not satisfactorily dete mined

The section hown in Figure 4 rep esents a sect on from the pe iton al fluid. Irregular cells with hyper chr matte nucl of various sues arranged in pseudo acms and papillae a e seen. This arrangement was also found in samples of picural B it dain in a biopsy specimen of an dule which appear d on the abdomi all wall flowing the pa acents. Probably if the abdominal fluid had been a amined at the time of previous a dimension the diagnosis of lid have been

made then

CASE S A4 year old white fem le was first ad mitt die to Une restly Hospital because of 1 reg lar s gual bleed ag Felvice sammation had disco ered eros on of the c rvix and several biops. pecimens taken on the outside had been reported as b ign Another hopsy speciment taken in the hops tal had been it port d as squamous careinoma. The pat ent was g ven rad un therapy and discharged A week was given rad un therapy and discharged A week seemen was presented to the left as an and the state of the state of the left as an and from sections of the state of the state of the left as an and from section of the state of the st

Chaical diagnosis A f	N f	Type ifful ramined in cases			while wh	Cases in which malicran	white fases	Confirm ny		Perceptage		
	Pleural	P	cal	P	ardial	cells re	II re	i und	Cases firm d	Cases	cases mits mail grass	
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TABLE IS -INCIDENCE OF MALIGNANT CELLS IN PUNCTURE FLUIDS

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Lun b ess			1								
The cul us pe u		_					i				
Pulm ry f re			1	_							
Atypeal um au			1	7							
P tal carrhosa										5	
Cad flur											
U ka n 1 gy							3			3	
771			70								

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#### SUMMARY OF RESULTS

From 1934 to 1944 17 samples of fluid aspirated from 14 patients have been examined for malignant cells. The technique and the diagnostic criteria discussed were used

in all cases. Catcinoma was suspected in all of the 14 patients at the time the fluids were examined and the study of the sediments was regarded as a means of establi hin, or confirming, the diagnosis. In 51 of the 14 cases the diagnosis at death or discharge was not carcinoma. The negative diagnosis was confirmed in 40 cases by autiopsy or exploratory laparotomy. In 91 patients carcinoma of some form was the final diagnosis at death or discharge.

TABLE II -- RESULTS OF FXAMINATION OF SEROSAL SURFACES

Ch cald gros	Co fi m d	Cases wh h serottl 1	Cases h h se osah mpl we fou d	Cases h b	Cases wh h m lgn il w found	Cases wh h
Carc nom 1 b ess						
Carcinom 11 g		*	3	5	3	5
L m hoblastom		(				
If pe eph m						
Com tecan	3	3	3		3	
Carca m ft II						
Care m fd od m						
Care norm i pa as						
Carcino 11/1 14						
Care nome I gall bl dil	1					
Caran m 1 m k	1	4				
Carcinom f1	6	٥				5
Ca 1 m	<b>——</b>					
Ca no [ ]						
Cart no I ovary			8	1	ī	
Cases f rci m		43	26			

Reference to Table Ia will show that in the or cases of suspected carcinoma examination of the sediment from fluids revealed malig nant cells in 4r or 45 per cent of the cases The fluids included pericardial a peritoneal 32 and pleural fluids 58 The highest pro portional incidence of tumor cells in aspirated fluid was found in the cases of carcinoma of the gastrointestinal tract where cells were reported in rr of r5 cases Tumor cells were found in 8 of 17 cases of carcinoma of the breast Although carcinoma of the ovary in clines toward peritoneal implantation in only 53 3 per cent of the cases did the fluid contain neoplastic cells Only 214 per cent of the cases of primary pulmonary carcinoma and 16 6 per cent of the cases of primary carci noma of the liver were reported as positive The t pericardial specimen contained neo plastic cells while 43 i per cent of the pleural fluids and 47 per cent of the peritoneal fluids revealed tumor cells

Confirmatory evidence of the diagnosis of carcinoma was obtained either by roentgen examination operation biopsy or autopsy in 67 of the 91 cases. Vutopsy was performed in 25 cases confirmatory biopsy or operation was obtained in o cases and appropriate roentgen custinated in confirmed the diagnosis in 100 cases in 100 cases.

cases The medence of positive fluids in the group of confirmed cases of carcinoma was 58 2 per cent or 39 of 67 cases All but 2 of the cases in which malignant cells were found in the fluids were included in this proved group. In all cases with a positive report of neoplastic cells diagnosis of carcinoma was confirmed clinically. In none of the 5r cases in which carcinoma was suspected but diagnosis other than carcinoma was eventually made were malignant cells wrongly reported

To obtain a more correct evaluation of pathologic examinations of puncture fluids an effort was made to collect a group of cases of confirmed carcinoma in which direct search for serosal implants had been made Forty four such cases were found in 28 autopsies were performed and in 16 cases examination of the serosal surface was made possible by operative means Table II presents the obser vations in these cases In 26 of the 44 cases definite serosal implants were found. Of these 26 cases 22 or 84 6 per cent of the fluids con tained neoplastic cells In only 1 case in which a positive report was returned on the fluid were serosal implants not found. The fact is that in those cases of carcinoma with effusions which contained tumor cells 95 per cent were proved to have serosal implants

TABLE III -RESULTS OF REPEAT EXAMINATIONS

		T				A PROPERTY	
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Lung	Pl ural	+	4 days				A ps
Long	Pleural	I -	7 days				Graved
Long	m t		499	+	cek	-	Bro boscope
To 1	Pleural	+	4 days	+			Opera
L	Pl urai	+	ls	+		7	A Pa
Lym bobles one	Flearel	-	Ł				A nfirmed
Rec m	Plut   pe to 1	+	3 ks	+			A pay
Lus	Pl L	-	w t				afirmed
wa p	Pl ral	-	- b	+	1		Y
B 85	Pl J	+	f days				B
Stoma h	Pleural pe 1	+	3 weeks	+		-	1
S m h	Pleu 1		week	+			x
Rec m	P to cal		2 d ys	+	l k		4 00

In 41 of the 14 patients fluids aspirated on two or more occasions were examined. This procedure was carried out because the results of the first examination did not agree with the clinical diagnosis or because the diagnosis was still uncertain. In 7 of these 41 cases the final diagnosis was not carcinoma. Table III shows the results of re-examinations of fluids from the 14 cases of carcinoma In 3 cases neoplastic cells were found in both orig mal and repeat examinations. In 2 cases in which a positive report was obtained in the first examination repeat reports were nega tive Of the 7 cases in which no cells were found in the original studies in 4 instances mangnant cells proved to be present at sub sequent observations. These results indicate that repeat examinations of puncture fluids are warranted and are sometimes essential to correct diagnosis When carcinoma is sus pected clinically a negative original report is not conclusive and more fluid should be exammed if possible

#### COMMENT

Clinicians are sometimes disappointed when the pathologist fails to find carcinoma cells in fluids obtained from patients in whom the diagnosis of carcinoma has been confirmed by reentgen or operative examinations. This is especially true in primary carcinoma of the lungs in which a low percentage of positive fluids was reported. From the observations in Table II this low incidence can be explained O.8 cases of pulmonary carcinoms in which studies of the pleurae were possible only a were found to have pleural implants and in all of these 3 cases the pleural fluid contained malignant cells. The effusions in cases of primary carcinoma of the lung are largely due to venous obstruction with transidation or to pleural irritation and exudation caused by inflammatory reactions secondary to primary growth in the lung. Pleural implants oc in the lest than one thrid of the cases

Many times abdominal and pelve surgers sattempted even in the face of po its peath olore reports on abdominal fluid in the lope that no peritoneal implantation has taken place. The results which have been discussed shatter this hope and the finding of cells into actes that seroest implantation has probable occurred and surgery is of only pullutary value. The prognosis is extremely poor in those patients in whom neoplastic cells are reported in puncture fluid.

#### SUMMARY AND CONCLUSIONS

In these cases of suspected carcinoma with effusion the diagnosis of carcinoma was e tablished or confirmed by examination of the sediment in 45 per cent of the cases Malignant cells were found in nearly 60 per

cent of fluids from cases of confirmed carci noma A positive report of malignant cells is indic

ative of carcinoma but a negative report is not conclusive When malignant cells are found in effusion fluids chances of having serosal implants are great (95%) prognosis poor and operation is inadvisable except as a palliative measure Effusions in those cases of confirmed car cinoma in which no cells are found may be due

to venous obstruction and pressure effects A definite diagnosis of carcinoma should be based on sections containing groups of cells arranged in definite acinar or papillary forma tion

Repeat examinations are essential when the diagnosis is still uncertain

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# EXPERIMENTAL STUDIES IN PFRIPHLRAL NERVE SURGERY

IV The Effect of Infection on Regeneration and Functional Recovery

LOYAL DAVIS M.D. FACS GEORGE PERRET M.D. d FREDERICK HILLER M.D.

Che go M. n. s.

N a previous article we presented a study of the healing of gunshot wounds involv ing peripheral nerves and were able to show that the majority of the wounds which were not chemotherapeutically treated became grossly infected. However the extensive changes produced within the perve and the delayed recovery of function were to a large extent the result of the nature of the injury and not directly related to infection In order to study the direct effect of infection on nerve repair and regeneration the sciatic nerve of 70 animals was sectioned and repaired under septic cooditions. None of the ordinary aseptic precautions were observed the shaven skin was not cleansed and the operation was performed with upwashed hands and upsterile instruments silk sutures gauze and cotton sponges and skin clip Some of the wounds became grossly infected and developed ab scesses and phlegmons the resulting septi cerus ended in the death of is animals. The wounds of the other animals were all cootam inated even thou, h no abscess formed Bacter ial cultures taken at the end of the operations showed a definite growth of Staphylococci albi and Bacilli protei Cultures of the purul nt material of the infected wounds revealed a predominating amount of nonhemolytic strepto cocci Staphylococci albi Bacilli protei and spore forming gram positive aerobic rods

The sectioned nerve was repaired by end to-end suture in 16 animals by the trans plantation of contaminated auto-enous grafts in 32 animals and of contaminated homo genous grafts in 31 animal. The infection which developed in these contaminated

From th D had four-ry \ ribwest railes esty \text{Ved cal School. The w k described in h pape was d mend to tract recomm ded by the Community of the between the call peer h between the call peer h is the call to the call peer h is the call p

wound formed abscesses 4 to 5 days after nerve repair. When the abscesses were not drained the animals died of 7 to 14 days later. No animals died of sepais in the group of contaminated and to-end sutures. Following transplantation of contaminated auto-enous grafts 4 of 32 animals died of sepais and 1 in 31 contaminated homo-enous grafts died of sepais. No death occurred in either of the latter proups when sulfonnamides were used locally in the wound at the time of nerve repair.

In most instances the nerves were found intact the sutures were bolding and the grafts were intact as they crossed the abscess cay ities. Skin subcutaneous tissue and muscle underwent partial liquefaction and necrosi long before the nerve became involved. How ever these nerves were sutured before the in fection became active the site of nerve repair was practically healed when the abscess formed and it became necessary to perform a more critical experiment to study the reaction of a nerve suture in a previously grossly in fected field. In 12 animal, the bed of the exposed sciatic nerve was infected with purplent material obtained from the abscess of another animal and the nerve was then sectioned Two days later the abscess which had devel oped was drained the wound debrided the nerve end trammed end to-end suture per formed and the wound closed Six of these animals died of the result of the sensis before the nerve could be sutured that is within 2 days after implantation of the purulent ma terral In the other 6 animals the nerve wa satisfactorily sutured Of these 3 specimen were removed after 14 days and the other 3 were allowed to recover for several months At the time of removal of these nerves a large amount of adhesions was encountered which immobilized the nerve at the site of the suture

When these adhesions were dissected away the nerve was found intact and resembled any other nerve repaired by primary end to-end suture Cultures taken from these virulent abscesses showed a heavy growth of non hemolytic streptococci Staphylococci albi and Bacilli protei

The gross appearance of the nerve and the suture lines was about the same 30 45 60 and 7, days after repair in end to end sutures autogenous and homogenous grafts. It corresponded to the description given in a previous article of the aseptic series. However the adhesions between the suture lines the grafts and the surrounding tissues were slightly more extensive and denser and the suture lines were more prominent. The grafts appeared to be thicker at the time of removal than at the time of transplantation and were slightly more voluminous than in the aseptic series and this was especially noticeable in the homogenous grafts (Tigs. 1 z 3).

Microscopic studies showed depending on the age of the specimen the same character istics of degeneration and regeneration as previously described for the aseptically repaired nerves. The regeneration of nerve fibers, the formation of axis cylinders mychnization and organization of the myelin decomposition products showed no appreciable differences from those findings in the aseptic group However in most of the septic animals a very strong epineural cellular and fibrous reaction was present after 30 and 45 days and persisted for 60 and even 75 days This reaction pro duced the appearance of a chronic permeu ritis and small lymphocytic foci were often encountered around the silk sutures and within the epineurium and interfascicular permeu rium. In the end to-end suture group this epineural reaction extended 1 to 2 centimeters proximal and distal from the suture line and was accompanied by a marked epi neural prohieration. In the autogenous grafts neurotization was equally as good in the septic as in the aseptic grafts provided no severe in fection took place Lymphocytic foci were found in the suture lines the epineurium and the interfascicular perincurium but no signs of inflammation or infection were present S ng G Obs pu So e

within the nerve fascicles The chronic peri neuritis did not interfere with nerve regenera tion The strong mesodermal reaction which took place in the enineurium produced diffu e adhesions between the enineurium and the surrounding muscles In the presence of a severe infection a complete necrosis of the graft occasionally took place and sometimes a necrosis of the aris cylinders of the central nerve segment was also observed Following necrosis of the ectodermal and the mesodermal tissues the original graft structure was re placed by a neuromatous type of tissue so that the organization and the later neurotiza tion of the graft were essentially heteromor phous in type Thus severe infection com pheated the internal graft structure and inter fered to a certain degree with the outgrowth of the regenerating nerve fibers. These how ever ultimately reached the distal suture line and the distal nerve segment where they fol lowed their normal isomorphous course to their end organs Although the histological structure of aseptically transplanted homo genous grafts was predominantly beteromor phous this type of organization and neuroti zation was still more accentuated in the sentic grafts Severe injections increased the degree of necrosis of the graft and led to a more pronounced heteromorphous organization Chronic lymphocytic foci were frequently found throughout the proliferated epineurium and penneurum even 150 days after the operation and in some cases lymphocytic infil trations were also present around the capil lanes within the nerve fascicles. However these chronic inflammatory processes did not interfere with neurotization

The reaction of the nerve suture line and the graft to infection was more clearly seen in the nerves which were repaired after an abscess cavity. It was interesting to study the reaction of the nerve severed within the abscess soutly. It was interesting to study the reaction of the nerve severed within the abscess before it was sutured. Two days after section the nerve fascicles of the distal and proximal stumps were surrounded by infected germeurum and epineurium which contained numerous abscesses and were in a state of hiely mesodermal prohiferation. No attempt at nerve regeneration had yet taken place in

the proximal segment. The infected granula tion tissue which had proluterated completely sealed off the open endoneural tubes of the proximal and the distal nerve segments and no evidence of infection or inflammation was present within the nerve fascicles. Regenera tion will thus be greatly delayed and impaired

Fourteen days after suture in the infected tield purulent infected and hyperemic me o dermal to sue surrounded the epineurium which contained scattered smalf hemorrhages Some suture abscesses were present but no inflammatory foci were seen within the nerve fascicles where regeneration had already taken place The same picture was present 21 days after suture Autogenous grafts removed from an abscess cavity 7 and 14 days after transplantation showed the same inflamma tory epineural and perineural reactions to in fection but no such changes had taken place within the nerve fascicles Homogenous grafts removed from abscess cavities 6 o 17 and 21 days after transplantation were com pletely necrotic suture abscesses were preent lymphocytic and leucocytic infiltrations hemorrhages and histiocytic proliferation had taken place in the epineurium and the peri Considerable hyperemia accom panied by perivascular lymphocytic infiltra tions and hemorrhages were also present within the nerve fascicles. It was interesting to note that the living nerve ie the proximal and distal nerve segments was protected against inflammatory processes whereas the necrotic homogenous graft took part in the infection in spite of the mesodermal reaction Thus the effect of severe infection was worse in homogenous than in autogenous grafts Living nerve tissue is protected from infec tion by its epineurium and perineurium which proliferate and keep the infection from enter ing the nerve fascicles

#### FUNCTIONAL RECOVERY

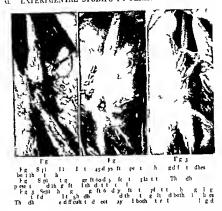
End to end satures There were no differences in the sequence and the rate of recovery between the septic and the aseptic groups of animals Motor recovery as tested by stance gait and voluntary motion of the leg muscles appeared around the 45th day after suture and motion in the dorsiflexors of the toes was seen

in only one animal of each group after 60 days Obvious muscular contractures were found in one septic animal which lived 618 days and in which all movements could be elicited Muscle atrophy was present in all animals its degree varied widely but there were no differences between the septic and the aseptic groups It was most marked 30 days after suture and diminished as recovery progressed Some signs of sensory recovery to pain and deep pressure in the foot were present in the septic as well as in the aseptic animals after 60 days A heel ulcer was present in one of the septic animals 45 days after suture. A reflex fanning of the 5th toe was obtained in one septic animal after 60 days Direct electrical stimulation of the perve above and be low the suture line with an alternatin 60 cycle current produced a plantar flexion of the foot in all animals after 45 days and a plantar flexion of the foot and toes and dorsi flexion of the foot in all the animals after 60 days There were no differences in respon e between the septic and the aseptic groups

One aseptic and two septic animals were allowed to recover for a years. One of them in which the scrattc nerve was sutured within the field of an absess showed complete motor sensory and trophic recovery after 8 months while the other two still had a marked weakness of the dorsule zors and the adductors

of the toes when sacrificed Autogenous grafts There were no significant differences in the sequence and the rate of functional recovery between the septic and the aseptic groups of animals. In all the ani mals of this group as well as in those with homo enous grafts the distal suture line was resected and resutured 45 60 and 75 days after transplantation of the graft. It was found that in the relatively short grafts used in these experiments the resection of the distal suture line of the graft did not delay or facil state the return of function as will be shown m a later article. For this reason, when refer ence is made to go 1 o or 50 day old grafts the signs of recovery were tested 45 65 and 75 days after secondary suture of the distal surure line

Gait and stance began to recover with a lifting of the heel 90 days after transplanta



tion of the graft and after 120 days some ant mal stepped on the plantar surface of the toes while others still continued to step on the dor sal surface of the toes when walking Recov ery of toe drop was however more mark d after 120 days. Obvious muscular contractures were seen in 3 animals with autogenous grafts 2 of them after sentic operation was present 135 days and the other 165 days after tran plantation, they involved in both instances the extensor digitorum longus. One of them had a large persistent trophic ulcer of the heel which was pre ent 60 days after tran plantation. Heel ulcers were pre ent in the 4 septic and 1 aseptic autogenous grafts and s of them occurred after secondary resection and resuture of the distal suture line of the graft. Mn cle atrophy was pre ent in all animals varying widely in range and dimin thing in the older grafts. There were no hill rine between the septic and aseptic rour.

Beginnin sensory recovery was found on the lateral aspect of the foot in eptie as well

as in aseptic animals 120 days after trans plantation of the graft this applies also to risponse to pressure of the toe pads. No fanning or step reflexes could be elected in this group of animals even 165 days after grafting of the nerve

Direct electrical stimulation of the nerve above on and below the graft produced plantar flexion of the foot in 80 per cent dorsi flexion of the foot in 100 per cent, and plantar flexion of the toes in 40 per cent of the ani mals oo days after transplantation of the graft After 120 days plantar flexion of the foot and toes was present in 100 per cent dorsiflexion of the foot in 50 per cent and fanning of the toes in 25 per cent of the ani mals and after 150 days plantar flexion of the foot was present in 80 per cent plantar flexion of the toes in 40 per cent dorsiflexion of the foot in 80 per cent dorsifiction of the toes in 60 per cent and fanning of the toes in 20 per cent of the sentic animal The average score of the total re ponse to electrical stimulation was about the same in septic as in aseptic ani



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mals after 90 days 44 per cent for the septic and 45 per cent for the aseptic after 1 o days 35 per cent and 57 per cent and after 150 days 56 per cent and 64 per cent respectively

Homogenous grafts More differences be tween the aseptic and the septic series were present in this group of animals than in the auto\_enous grafts and the end to end sutures



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This may be due to the more extensive necrosis and greater vulnerability of the homo genous graft in the pre ence of infection and the resulting more complicated pattern of organization and rereneration. No recovers in stance and gait nere obserted in the first 73 days after tran plantation of the graft. Lift into of the heel when standing beran to recover after 90 days 4fter 120 days only 25 per cent of the animals showed ome recovers a



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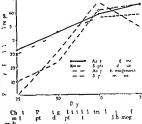


compared to 80 per cent in the aseptic series and after 150 days the heel drop was recover ing in 30 per cent of the septic and 100 per cent of the aseptic animals. Toe drop or walking on the dorsal surface of the toes was

oresent in all animal after 150 days

Infection had no influence on the development of mu cular contractures. Of the 6 cases with obviou contractures 2 belonged to the septie and 4 to the a eptie series. They were present 120 days after transplantation of the graft and involved me the the extensor digiterum longus. Infection had no influence on the development of heel ulcers neither was the formation of heel ulcers associated with mu cular contractures or an increa ed amount of adhesions around the nerve. Heel ulcers occurred in 3 of 17 animal examined Muscle atrophy was present in all animal and there was no difference between the septic and aseptic groups. After oo days the gastroe nemius oleus muscle group had lost 70 per cent to 80 per cent of its weight after i o day this lo of weight varied between 50 per cent and 62 per cent and after 150 days it decrea el te about 40 per cent

ritical recovery if jun ensation was f und after too day in either the septic or acepti gr up. In 2 year old experiments complete return of sensation was found in



both groups Step reflex of the foot and fan ning reflex of the toes were late signs of recovery. They were not seen in homogenous grafts after 150 days but were present 2 years after implantation of the graft in both

There was no response to direct electrical stimulation of the nerve or the graft during the first 75 days after transplantation. After 90 days plantar flevion of the foot was obtained in 75, per cent dorsification of the foot in 25 per cent and plantar flevion of the toos in 30 per cent of the spotte animals. After 10 days plantar flevion of the foot and toos and dorsification of the foot and toos and dorsification of the foot the process of the foot and toos and of the foot was present in 100 per cent and dorsification of the toos in 5 per cent and of the foot and toos and toos and toos and toos and toos for the foot and toos and toos and toos for the foot and toos for the foot for the foot the foot and toos and toos for suffering of the foot

The accompanying chart shows in percentage the average score of total electrical rispons, for all the animals in the septic and aseptic auto genous and homogenous grafts. The discrepancy between the percentage curve of the septic and a eptic homogenous grafts may be related to the severity of the infection in in dividual cases and the relatively small number of animals with septic homogenous grafts that were studied.

#### SUMMARY

Infection at the site of repair of a severed peripheral nerve increases the amount of ad



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Jo per cent and 04 per cent respectively. Homogenous grafts. More differences be tween the a optic and the septic series were present in this group of animals than in the auto\_enous grafts and the end to end sutures.

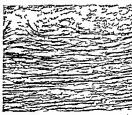


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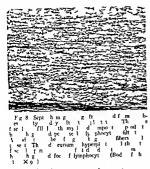
This may be due to the more extensive necro is and greater vulnerability of the homo genous eraft in the presence of infection and the resulting more complicated pattern of organization and regeneration. No recovery in stance and gait were observed in the first 13 days after transplantation of the graft. Lift ing of the heel when standing began to recover after 90 days After 120 days only 25 per cent of the animals showed some recovery as



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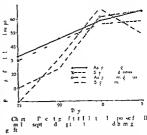
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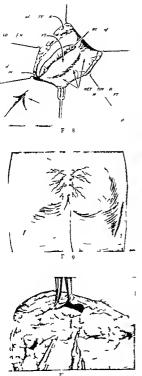
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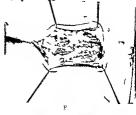
There was no re ponse to direct electrical stimulation of the nerve or the graft during the first 7, days after transplantation. After 90 days plantar flevion of the foot was old tained in 75 per cent dorsift-vion of the foot in 2, per cent and plantar flevion of the toes in 50 per cent of the septie animals. After 10 days plantar flevion of the foot and toes and dorsiftevion of the foot was present in 100 per cent and dorsiftevion of the toes in 2, per cent of the animals. After 1,00 days this percentage dropped to 6, per cent for plantar flevion of the foot and toes and dorsiftevion of the toes and to 3,5 per cent for fleving flevion of the foot and toes and dorsiftevion of the foot

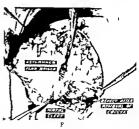
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#### SUMMARY

Infection at the ite of repair of a severed peripheral nerve increases the amount of ad

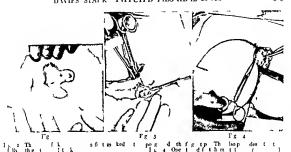






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ticular care is necessary to ensure the complete division of the natal cleft fascia along the medial border of the flap ight down to its for enangle at the tip of the coccus otherwise the object of the operation will be defeated and



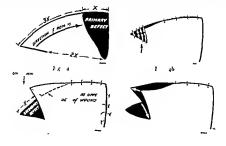
I's 3 Th'rid kill f blood 1; mpl g dead pace will result in the coccygual zone because the gluteal fat cannot enter the defect

This operation is a plastic operation. The handling of the flap with ordinary surgical in truments is to be avoided and fine hooks or guy sutures alone should be employed.

Hemostasis must be perfect and only very tine plain catgut is permi sible (No 6000) as a ligature material. Four or five mattres, su tures of fine silk pass through the skin and fat of one side about 1/4 inch from the skin edge pick up the sacral ligaments and emerge through the fat and skin of the flap (Fig. 16)

Ip poed flap d

It is important to ensure that the suture when tied will draw a quantity of the fat of the flap into the dead pace. These sutures are placed and left long but not tied as they are sub-equently employed to fix an anchor



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dr.ssing One to two grams of sulfanilamide

powder are dusted into the wound

A second series of similar mattress sutures lying between the first series are inserted but pick up each skin edge and are tied as inserted to stress this precaution because accurate apposition of the cutaneous ed es is very important (Figs. 17.18). It is essential to see that the dead space is closed at the tip of the coccy was the point may be overlooked. These subtres are continued along the upper border of the flap to clo e the buttock wound.

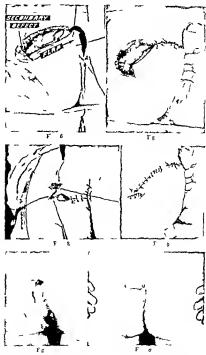
it the re entrant angle of the flap 2 cubic centimeters of pla ma (group o) and 2 cubic centimeters of thrombin topical are separately inserted. On occasions we have mixed 10 000 to 15 000 units of penicillin with the plasma The flap is lightly compressed to ensure pread ing of the solutions and held for a minute until the fibrin forms An assi tant now main tains pre sure on the flap until the secondars defect is closed. With small flaps direct suture suffices (Lig 18) The delicate fibrin i vation of the flap should not at this stage be h turbed by rough suturing or other mampu lation Hem stasis has thus been most satis factorily effected in our cases-an important proj hylactic against hematoma formation un ler the flat which has been our most frequent omplication of this method

With larg flip the secondary defect is in n exten ive and requires a Z plastic (1 igs 18 19) Where the rotating re-entrant angle overlaps the upper border of the wound a Z flap is cut the angle being let into the upper border and the relavation of the upper edge

now permits closure of the wound (Fig. 14). The anchor dressing is tied in place and no further wound dressing is employed. A super ficial pad is fixed in place with elastoplast. The patient is permitted to he on his back if he so desires. The bowel are opened as soon as the patient begins to experience any all dominal di comfort. The anchor dressing is rumoved on the twelfith day, and the patient is kept in hed for 21 days. A careful watch



w and I feed Gilles hook bef be d led



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must be maintained for the occurrence of a hematoma under the buttock flap this occur and be overlooked infection may supervene. The natal cleft has healed by first intention in 18 of our last 21 cases and remained healed. Hematoma occurred under the buttock flap in 6 cases but not in any case in which fibrin fixation was employed. In cases the hematoma became infected and drained strentococcal bus for 10 days but was rea lily controlled with local penicillin therapy

The method was employed recently to close a trophic infected sacrococcygeal ulcer of 2 years duration resulting from a gunshot wound of the cauda courna with ancethosia of the third fourth and fifth sacral segments Local penicilin therapy was used prophylacti cally for 14 days. Healing occurred by first intention

The resiliency and firmness of the flap at the third month have been striking in the e cases which have been followed up for that period Some patients complain of tenderness of the flan for a few weeks but the majority state that no symptoms cyist

The method is pre ented in the hope that those having acce to a large number of cases will afford it a fair trial As with all plastic procedure a careful and meticulous technique pays large dividends

#### SUMMARY

1 The irregularity of the embry onic epithe hum of the natal cleft and the persistence of natal dimi les in young adults supports the theory that pilonidal sinuses are tubul ler m id of the natal cleft

- 2 The very high incidence among service per onnel suggests that the vigorous and un hygienic conditions of service life may be im portant contributory factors
- 3 The growth of the sinus into the fascia of th natal cleft is de cribed. The anatomical di position of this fascia governs the primary spread of the sinus
- 4 The natal eleft possesses a poor blood supply derived mainly from small medial twigs of the posterior perforating arteries from the sacral foramina Secondary tracks of the sinus may enter the buttock along these twigs 3 In all except the smallest operative de feets closure by direct suture is madvisable because the rigidity of the buttock fascia prevents free approximation in the subcutaneous
- 6 1 method is described which has a wide application avoids tension introduces a new blood supply and permits restoration of the natal cleft. The pitfalls of the method are emphasized
- 7 The difficulties and travail experienced in 4 ca es of large infected pilonidal sinu es treated by this method are epitomized

#### RELERENCES

## LACERATIONS OF THE PERINLUM AND THEIR REPAIR

## A Study Based on 2325 Personal Cases

## LOUIS E PHANEUF MD S D FACS B t Ms ch s tt

ACERATION of the permeum 1 one of the commonest lessons in gypecology. With the exception of the few cases which may be due to external trauma this disorder is the result of thiblinth and occurs during the passage of the fetal of a through the damaged birth canal has led to a volumnous liter ature and to the proposal of many operative procedures one of which are ill advised.

Lacerations of the perineum are divided into recent lacerations or tears seen at the time of child birth a d old or remote lacerations in which healing has been left to natu e and scar t sue has formed between the ednes of the torn structures Those of the fir t group al o known as obstetrical lacerations of the permeum are divided into three degrees In the first degree only the mucosa of the vaning is invol ed and the perineal muscles e cape in the second de ree the amnal mucosa and permeal muscle are involved in the third de gree the vaginal mucosa the pe meal muscles the sphincter a ii muscle and not infrequently the rectovaginal septum are included in the proc e s Lacerat one of the second group comprie the so called gynecologic lacerat ons. They are referred to as incomplete when the tear extends through the perineal body but not through the sphincter and muscle and re toy ginal septum and as c mplete when the tw last ment oned structu es are damaged

The gyne ologist and sur con al o have to deal with still another form of inpury, to the pelvis officer namely, the r is, ed vs. in and outlet in which there was no apparent external tear at the time of childburth but eparation of the muscular and is call structures easied under the intact mucosa and kim. This disorder is usu in accompanied by protrusson of the rectum between the separat of supporting planes. The protrussion is referred to a a rectocete indirect meaning the supporting planes. The protrussion is referred to a a rectocete indirect meaning the supporting the supporting planes.

Repair of the lac r ted perincum or damaged pel ic floor m y be classified as mimed ate inter

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med ate and late repair or pennen haphs. In man repair is carried out the time of childs the and should be done whe ever the surround, a a su table. Injuries to the pel refloor are gent all, sutured in ho pital del eries. The current practice of episiolomi or meision of the penneum extensively emplored du j gite last to decade has prevented the jag,ed and multiple lacerators which were morountered before this miple measure was adopted. A strait hit ness on placed by the observer when the extensit it be as simpler suture than an urre ular tear and the results stanted is far superior to that of the irregular tearned and occur when conditions are left to when many occur when conditions are left to

Improvement in the repair of recent injuries t the pelv c floor has come throu h the impr e ment of sur ery n general and by the u e of fine suture material Nowadays a strand of No o chrom c catgut is found to be adequate in su hire pairs where formerly a strand of No 2 chrom c catgut was u ed. The involved planes of the pelvic floor are appro imated in layers the Leynote be in, accur to approximation without tension. The mass approximation of all structures with large nonab orbable through and the on heutures which leads to a firm rest tant frequently par ful and thick perineal body is not practiced by well te med operato s When such a method has ben employed at a not unu ual to find pa nful rid es r scars ac oss the sk n as the result of sutures too tightly ted Opin on is duded a to the proper meth d of cle ing the skin in an episiotomy o r cent repair of the permeum. The e are those ho advo ate the use of fine catgut in the form of a

th timetrupted attures of fe. It. preps. I. M. molon the o absorbable material add a sense of security since it not i frequently occur that the face cargut stures on stantly bathed i the lock a abso b prem to ely and c use sep art ton of the skin edges before healing has been on pelect. Eps to mens are de ibed a media when the into ion is made in the pe incal body in the med an line and as m of olateral and terral upth or left, when the in ion is placed a c side o the other of the median lice. Since the esserts the side of the other of the median lice is the cut the esserts of the other of the median lice.

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more tension on the edges of the lateral mix ion it an eister in the me han fine silk or mylon utures offer a certain a lyanting in coaing the kin in the ferrier tyre of incision. I caur of cent injuries of the perineums is usually very this factory if in tyr g the leep utures tension has been a oude!

Intermediate repair of recent perineal injuries l as never attained much vogue and has had but little place in the obstetrician's armamentarium since most lacerations and inci ions are repaired at the time of childbirth. However there are occasions when the condition of the parturent because I a long exhausting labor hemorrhage liff cult delivery and poor urroundings for per forming its mediate repair makes it inadvisable to recon truct the permeum at the time of the de livery. In the group of patients the choice rests between intermediate repair and the performance of a gynerol gic operation 3 months or more fol lowing parturition after the perineum has been allowed to heal by scar tis ue Intermediate repair commonly carried out to days after childbirth The parts are prepared with a nonirritating ger mici lal solution the granulation tissue is curette l from the torn e lges and approximation 1 carried out by means of loo ely tied sutures of fine cateut in the deep ti sucs and tho e of nonab orbable material in the kin

The late repair of lacerations of the pelvic floor with or without accompanying rectocele is per formed by the gynecologist or surgeon a hen heal ing of the torn to sues has taken place I v scar tis sue an linvoluti n of the involved stru tures after parturition has been accomplished It a wise plan to allow at least 3 months to elapse after hildbirth before sucl an operation is attempted reglected less us perineal lacerati us and a re laxed vaginal outlet with concorn tant re tocele and enterocele not infrequently come to the gynecol g st or urgeon many years after the or ginal accident 25 in leven 50 years sometimes having elapse I in my experience Furthermore perincorrhaphy is eldom performed as a ingle operat in rather it is performed in connection with other of erations for 1 rolanse in connection with hi terectoms and with other genecolog intervents ns

In examination of the null jarous perincum reclishatitis elastic gives adequate support and sin i painful to judin in Increonstructing dijelo cloor the operator hould aim in o far as posible to restore the parts to their original i im lin juny se can be accomplished by laver priori matton will suffersion of the tissues and by the employment of fine suture matter: It is defeated

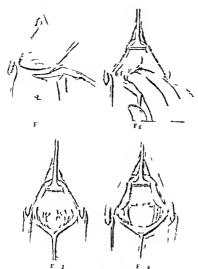
by the approximation of all the structures in one layer by large nonabsorbable sutures

### TICH MOUT OF SECOND ARY IT RINFORRII APIIA

Having previously de cril ed and illustrate I the technique of the operation for complete tears of the periodium as I perform I (i = 2) i > i ill limit my description at this time to the technique of per forming late or econdary perineoral aphy for in complete tears

Preoperati e prepa atton Two nights before entering the ho pital the patient takes a aline eathartic in the form of magnesium sulfate o dium phosphate or solution of citrate of magne sia After the bowels have been thoroughly evacu ated she remains on a light diet until admi sion The afternoon before operation the external gen itals are h ved and gently scrubbed vith gauze and tincture of green oap particular attention being paid to the anus to the folds about the vulsa and to the mons veneris. The parts are then rin ed with sterile vater and with nonirritat ing potassium mercutic iodide olution i roco 1 vaginal douche is given consisting of a drachms (8 gm) of compound zinc sulfate now der (National Formulary 111) in 2 quarts (2 liters) of warm vater. A cap uls enema is administered the afternoon or e ening before operation but not on the morning of operation. After the induction of anesthesia the parts are prepared in the operat ing room by cleaning the external genitals with etl er and painting them with tinctute of zephiran and by painting the vagina with tincture of zephiran In the pre ence of considerable varinal discharge the vulva and vagina are gently crubbed with tincture of green soap and warm t ater rinsed with a 1000 potassium mercurio sodide solution and painted with include of zenhiran. The sterile drapings are applied and the anus is covered with a sterile gauze sponge which is held in place by means of two towel

Operature poedure A self retaining perineal retractor is used to spread the labia apart. Preference is given to the Friedman type of retractor but if this shoot available a Gelpi retractor may be used. Another satisfactory method of exposing the just's consists of using fire silk sutures held in termostats on each side of the vulva and at the posterior commission. The advantage of using self retaining retractors is that this leaves the hands of the assistants unencumbered. The pelvic floor is opened at the mucocutaneous border it is my be done with Finmet existors (Fig. 1). May occasion of a scalpel. The posterior in 1910 of the into into the film of the floor is opened at the microcutaneous border it is my be done with Finmet existors (Fig. 1). May occasion of a scalpel. The posterior in 1910 of the into into the film of the median line will an 'Ul.

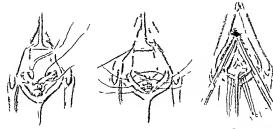


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forceps and the posterior vae al wall is separated from the rectum and the perincal muscles by sharp and blunt dissect on using the g uze or erd fingers (Fig. ). In the illustration for greate clarity the gauze is not in luded. Figure 3 shows this part of the dissection almost completed and F gure 4 shows the completed dissect on. The sep atton of the posterior v. ginal wall form the re turn and the perincal muscles is facilitated by using a T fo. eps which h lds the

sæmal wall firmly and does not slip. The pen neums is then ree nstructed 1) app or mat gfour layers of tassue. The cru a of the pubococcyg muscles whi ha ep t of the le ator ani muscles are app ownated in the median 1 e by three interrupted soutures of N. o chromic catgut to narrow the sp. ce between the t medial mag gas of the le ator ani muscles d to o ercom the cetoccle (F.g. 5). These ind laye imprises the uronemated daphragim made p of the deep



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trans ersus pennel muscle and its covering fas one Three sutures of the ame materal are place I in these structures and left until (Fig. 6) A triangle of the posteri r vaginal wall with the pux at the crest of the rectocele is resecte 1 When there is considerable re lundancy this is lacilitated by the use of Ochsner clamps on each sile but they may be omitted if the opposite condition e 1sts (Fig. 7) The vaginal part of the inc. ion is clo ed vith interrur te l'sutures ol No o chromic catgut (Fig 8) and the three sutures in the urogenital hapl ragm are tell and cut. The skin elge is free I from the underlying scar tissue so that it can be approximated later without tension an important desideratum i hen fine cateut is used in the skin (lig o) The third layer consist ing of Colles fiscia is united itI a continuous uture f \ 00 chromic catgut (Fig 0) The skin i rms ti e fourth layer an i is approximate i th a runn ng suture of No 00 chrom c catgut the en is of which are arrested with I als! to at the! er angle of the skin inc. ion there is al. axs. edun lant tissue which il not removed appears a protuberance. It is important to esect this to ue in or ler to lea e a flat surface hen the uture 1 completed (Fig. 11) At the completion f the peration of permeorrhaphy the nly part that shows is the 25 to 50 centimeters of skin

which covers the operative field. Many operators pay little attention to this skin and in closing it leave dog cars uneven surfaces and a protuber ance at the lower angl of the incision. Using lead shots instead of tving the sutures and resecting the skin at the low er angle of the incision resists in a flat even surface giving a statisfactory plastic result. The vagina is lovely packed with rodoform guize the end of v birth is held by a silk suture attached to the inner aspect of the thigh v a small piece of a thesit plaster. This step in the procedure greatly ficultates the finding of the gauze for removal at the end of 24 hours (Fig. 12).

Interpretate v are Morphine and codeine are

sature line is painted the 4 per cent aqueous mercurochrome or aqueous olution of zephiran after each micturition and delecation. Forty eight hours after operation a laist doucle of compound zine sulfate powder (National Formulari VII) i Irachin (g mg) in i quart (goo cc) of arm sterile water is given and it is treatment i repeated daily as long as the patient remains in the hospital. A No 22 French male soft rubber cathetic is used as a doucle tup. If cathetization i necessary, in the first few days after operation of great care should be used in separating the labia

prescribed in sufficient amounts to allay pain. The



ditis

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to expo e the urinary meatus since the upper part of the incision is held by fine catgut sutures and may separate if force is used. The bonels are moved on the third postoperative day A fauly enerous diet is given on the fifth postoperative day The patient is allowed out of bed on the morning of the ty elith day and is discharged from the ho pital on the fourteenth day after one ation

#### STATISTICS

From May 9 7 to June 30 944 app ou mately 7 years I have operated on 328 women for lacerat ons or inc sions of the permeum In the eries there were 1 5,5 gynecologi or sec ondars operations on the pe meum and 77 ob stetric o primary operations

The gynecolo 1c or secondary repairs were clasified as follows

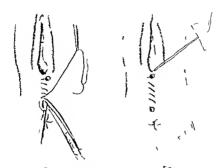
The ob tetric rep ir we e la sified a follor s

Results All these patients obtained sat fac tory perineal support. During the d s when la ge suture material was used there was senam tion of the uperficial to ues in a mall group of cases the e act number of nh ch i as not deter mined In these pat ents healin was by second intention

If reality In this series of 2 328 cases the c were 14 deaths r gynecologic and obstetue a gros mo tality of 0 6 per cent. The detail of these deaths are given in the following case s m mane^ GYNECOLOGIC DEATHS

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In the group of 12 patients the permeorrhaphy was d ne as a complement of an extensive expectlogic operation. The deaths were due to the extensive liverse for all ich the main operations were performed rather than to the perm a rehaphy. In n) case was the perme trhaphy performed as a s gle operation

## OB THERIC DEATHS

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#### CONCLU IONS

The uccess of the operat on of permeorrhaphy depends on careful preparation of the operative field and the maintenance of a r o d asep is sharp rather than blunt dissection whenever leasable to

avoid bruis ng the tissues the approxim ton the tissues in layers (we prefer four laves) in the tissues and layers (we prefer four laves) in the than mass approximation since this maint suppleness and elasticity as well as support and oxods painful rigid to employ ment of the suit material and accurate approximation of the tissues without tension, and carefully pl need and executed postoperate e care.

A eries of 2,3 8 personal cases i repoted in

### REFERENCES

## THE FASCIA OF THE DORSUM OF THE HAND

## BARRY J ANSON 1 h D (Med Sc) ROBERT R WRICHT M D 1RANNIN I ASHLEY M D 1 JACK DIKES M D Ch cag Illino s

Iff texture contents and relations of the fascal layers which oe er the fascal layers which oe or the sam of the hand art of interest alike to the anatomist and to the surgest of the fast of the fas

#### MATERIALS AND METHODS

The dorsal layer of the hand ver studied in several specially lissected specimens and then in more than it enty five hands in the students liboratory. After the scheme of stratification had been established two pecimens were prepared for illustrations one showing the later opened from the surface in and (i.g. x) the other depicting the mass seen in our back section (fig.)

#### LITER VIUKE

Of the various textbook accounts that (Ouan in the most satisfactory. Ouan however describes only to lavers the outer one is said to entain the loresal annular ligament and list lly to lecome continuous with the extensor ten lons on the fingers the inner laver is stretched over the intermetacarpal paces and its adherent to the subjection the said interosecous muscles. These two limella according to Quain are continuous with each other in the internals separating the ten lons at the digital clefts better the two limella according to Quain are continuous with each other in the internals separating the ten lons at the digital clefts better the two largest the current the extensor tendons and their heutils. In their stain is I textbooks in the higamentous picketing are leserted in mental aftering in the

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In kanavel's treatise based upon ectioned and unjected material areas of interfascal space and demonstrated. Since these spaces two in number possess definite marginal boundaries evu late can spread within them over the entire dorsal as pect of the hand. The more important one of these superimpo ed compartments is situated I e neath the extensor tendons and up on the meta carnal biones and the interosec

#### OBSERVATIONS AND DISCUSSION

In studies of fascril and aponeurotic stratisuch as those just described the thicker lavers stand out prominently on cut surfaces and appear as membranes bounding impected masses. However the lavers may be clarified by careful dissection this procedure serving to establish continuities and to demonstrate regional differences in texture and attachment.

The several strata which were invariably evident in the authors specimens vill now be consi lered in succession from the integument to the

interesseon musculature

Integume t The integument over the dorsum of the hand and digits (Figs. r and z laver f) is thin in a comparison vith that of the palm. It is loo ely attached to the un lerlying fascia a circumstance which permits of considerable freedom of movement of the skin over the subjacent tissues.

I ave of st pe fictal factor. The superfictal fast can of the dorsum of the han 1 is two layered. The superficial later is thin and somewhat fatt, in consistence, (Figs. 1 and 2 at B) it contains only a few receds which pierce it on their way to the skin. In spare pecimens this layer is very thin and may be separately demonstrable over the entire does must of the hand.

Deep lay f siperficial fastia. The deeper stratum is almost always the more definite of the two. It is of uniform thickness over the entire dorsum of the hand (Figs 1 and 2 at C). This layer transmits the superficial vessels and the cutaneous nerves. At the web of the fingers and at the mirgins of the hand I the two layers are no longer it into conjoined they become continu

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ous with the superficial fascia of the palma s

A cle 1 a e plane evist between the deep layer of the sp & focal face a not the ubspacent tratum (F gs 1 and he theren C and D). The latter forms a roof fo the compartment occup ed by the etensor tendous and their en clopin coats. The trise of this clea age, plane 1 of arcelar christer and entry into tis smore readily, made the ninto their use which fasten then to ument to the superfi alf a a It would ssumedly be a pline alon. In chain evide wo lid bepine to spead. The uthors dentif in the out it dorsal space of hand el description.

Suprate di ous j sc. Upon effecti n then of the deep la er of the h! mm r upe ! cmal fast cat the la er evpo ed th. ool of the omp it ment in which the lo tendons a e ont ed. It i non fatth and vers strong and nt. ins learly the labers which contribute t. the appear

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the equ lent of th septa se t deeply to the metacargal I'm the p lmar apo eur o the ppo te spect of the had D talls the fa us s the eap lart of the meta prophal gel pont and vill the personse m cetters de fea hextens ten lo. B tweed at the l've cose the interspace to firms created m in tea ho the fine that c at tes (Fg t small arr w). Round the free dets the or lying superficial fasse of the free dets the or lying superficial fasse of the



lorsun of the hand I ecomes continuous with the equi alent layer on the palm (Fig. 1 tag of fascia cut and held by forceps). Fusion of the supra ten linous fascia (layer D) and the infratend nous fascia (layer I) occurs at the clefts between the fingers over the pl alanges and at the sides of the metacarral part of the hand soas to form a definite

circum cril ed compartment (hereinafter) hasers of extensor tend is Under the layer just lescribed and resting upon another equally his tinct there occurs a fascial investment for the extensor ten lons and their synovial sheath (Figs. ran l z at E) Marg nally it is a single layer but then ten lons are encountered it plits to enclose them. The layer is thin yet readily dissectable When exposed by reflection of the supratentimous fa cia it appears as a fascial plate attached me d ally and laterally to the compartment s vall It is to t distally where at each metacarpophalan geal 1 int it becomes 1 art of the fibr us invest ment of the dorsal tendinous expansion proxi mally it is prolonged on the extensor ten lons to become in the forearm the perimysial in est ment f the extensor muscles In rassing fr m the manual into the antibrachial region this envelop

ng fiscia i ri the tendons lies beneath the d risal carpal I gament—which latter 1 a locally percal teed part of the uprater himosy fascia it rests up a na equally str ng later 3 hi h for purpose i c mene see un recording t pograph 1 al uc es n max be ref rred to as the infrater I ous

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ta is the firn est layer on the dorsum of the hand

(Fig. 1 at Γ lifted by forceps on radial ide of hand) The layer is situated next below the thin fascial envelope of the tendons. Over the carpus the infratendinous fascia is fused with the perios teum and ligaments of the carpal bones. At the level of the carpometacarpal joints the fascia be comes a distinct layer bridging the metacarpal bones There it is fused laterally to the dorsum of metacarpal II and medially to metacarpal \ these areas it then continue its spread margin ally where in conjunction with the supraten di ous fascia it becomes the investing fa cia of the first dorsal intero seous and of the ab luctor of the fifth finger on the radial and ulnar sides of the hand re pectively. On its deep aspect the fascia in some specimens is attached to the other metacarpal bones (namely III and II) with the result that the subjacent space-between the in f aten lineus layer and that covering the interest scous muscles-is locally and partially subdivided int le er paces

Thus the uprate dinous fascia and infraten linous layer fused along the sides and the distal extremits of the metacarpus are the walls of a ompartment in which the exten or tendons are upended by a special membranous sheet which was linicides the whole compartment into two super imposed pertions. At the wrist where the outer (up rat n hinous) layer is entimous with the antified of the activities of the side of the side of the content and the content and the content are are continuous with the boars. Inguisers and articular capsules at the

nst joint the compartment is essentially closed through fusion of the constituent layers with the ligamentous vall of the everal canals vleth tran mit the extensor tendons into the hand Within these canals the tendons are c vered by their esparate portions of the lave which as a fascial plate spl is to enclo e them in the hand Since the e-egregated portions are then prolon ed into the f rearm to become perimsual investments of the e tensor mu cles the fascia of the tendons would be expected to be esparate from the surround no walls of the canals. Actually however some fusion occurs so that the capaco us dorsal compartment is not continuous with the antibrachial paces which he with n the dorsal sleve of fascia.

I terosseous fase a The interosseous stratum immediately beneath the infratendinous laver and can be separated from it by blunt dissection (Fir 1 at G lifted by book) A loose arcola tis sue sometimes containing a slight amount of fat separates these two layers of fascia. The interes seous fascia is fused with each of the metacarpal bones and is intimately adhe ent to the intero se ous muscles which take their origin in part from its deep aspect. The laver 1 thin and is essen tiall a perimy sium for the interesse similar to that which surrounds the sacrospinalis muscle within the lumbodorsal aponeuros and the rectus muscle within its sheath. Distally the fasc a ensheathes the tendons of the interosee f ally reaching the dorsal tendinous exp asions of the digits. In so doing it fuses with the several laye s previously described which are ca ned outwa d upon the extensor tendons

#### CONCLUSIONS

Conventional accounts of dorsal m nual structure describe only two lacers is tuated at subcutaneous and at o seous levels. The eare termed superficil and deep fascase. But in careful disections of the hand a mu h more complex ar n n ement of layers is encounte ed related chiefly to the extensor tendons.

Both the superficual fas a and the deep fasca a e blain mar. The lax so of the superficual are like the correspondin st ata of the in-munal of other a e s fatts and membra ous. The latest of the deep fasca are not o h n n fatts but beave a d sufficiently banded to be cons dered ap neur t t. These are placed p n and bene th the extensor te doos and the latters prope fast a coat. The superatendin us lave 1 continuous o e th. nn t with the ant brack alf sca m it is 1 doed it e dorsal carpal 1, ament the inf at n d Whereas then n the fo carm the deep fas 12 a sleeve for the e tens m unde-between adja.

cent members of thiclet it send septain arti o scous le el-in the hand it forms a compart ment for the tendons of the same mu cles a um ing the character of an envelope flattened again ! the metacarpal bones and intervenin ( nterove ous) mu cles To either s de of the lo g tend us on the dorsum of the hand these two lavers of the deep fascia fuse thus while the deep fascia is hilaminar th ough the greater part of its manual e tent it is single lavered on the ulnar and radial sides of the carpus In the former situati n it b comes the investing fascia of the first intero cous muscle v h le in the latter position it erves simi larly for the abductor of the fifth d t Dit liv the two meet at metacarpophala geal le el to close the compartment in front on the phala is prolongations enclose and fuse s ith the d rol tendinous expansions proximally their fbrous tissue becomes part of the li amentous t ssue l'n in, the sulci on the extrem ties of the radius and nlna

In the antibrachial region the extensor muscles are closely invested by a perimys I sheath. Comparably in the dorsal manual compartment (formed by splitting of the deep fa cas) thep in mysal its us I bro denoted to pod ce a th transierse septium which splitts to encle the extensor tendons it is fastened at each sude by attachment to the side valls of the compartmet it where the supprised however, more than that nous law ro of la cas. It is the mimed ate cover of the synow all sheaths

The infratendmous laver if the deep fas a series also as a the ch sheath for the inte os e a muscles. As in the structure of sheatha gener like layer next below—immed after covering the muscles—is the low—immed after covering the its apo eutor c sheath is surrounded by a lay rof permiys all nature so the inter see below the infratendimous statum a e c vered by an excess with thin fasted. O e the metacarpal bones the interostous fasca for each thin fasted of the carp metacarpal and metacarpoland grad junts the layer become p rt if the carpsular them of the retucular ins

The present autho s w uld identify the s per fal and deep p re so if Kanavels descript on s the a c har pia es abo e a d below the larrest of the d real omp rim nt o e of these would be stut ted between the deep law rof uperfillars can and the sup tendin u diio of the deep fasca whe then the ull te fill better the nitat ind u pt in the leep fasci dithe fis in of the intreum the unit new must be Both of these p sare sep riif om the dorsale mpt unent nether c responds truct all to the

mili almar compartment on the oj posite aspect

of the han l

In the most frequent type of infection of the dorsum of the hand as described in the excellent accounts by kanavel Mason and koch the spixes not the compartment ould be affected. In infections caused by kacerating injuries in the carpil region however it would be expected that the synonial sheaths and the surrounding compartment would be involved. Such cases hould

Le studied further in relation to the arrangement of dorsal manual strata

#### REFERENCES

# A MILTHOD FOR THE SURCICAL OBSTRUCTION OF THE FALLOPIAN LUBE

## Animal Experimentation

EARI GFORCE LRIEG MD D t ont M chiga

a comprehens e review of the subjet of surgical obstruction of the fallopan tube kees has shown that there has been a an able but disturbing number of fallures retrieved the surgical observations of the subject of the surgical observations. It is also been the able of the surgical observation of the surgical observations of the surgi

use today have favored the obstructing of the genital canal at some point in the fallonian tube The Madlemer technique or some modification thereof was most frequently use! Resection of the cornus followed by some metho i of burying the distal tul al end into the surrounding tissues was secon! Mikulicz and Dekerson each reported methods which produced strictu e of the comuni end if the tube from within the uterine cavity which reduced these operations to an office riced re More recently Power and Barnes have ret ried the production of stricture of the salpin It mean of an electrode introdu ed through a ly it scope The procedure of hoice from the ta li int of simplicity and ease of performance is till that of crusting an I tying of a tubal seg me t. The tr ee latte auth is have presented method I ser neigle of le traing the mucous meml run laver in or ir to allo fi ro is is n a rl with the it help prese ted t the paper

The pre ent investigation set forth primarily a simple modification of the Malleiner technique designed to eliminate the failure of closing the Jassage completely. Secon! the study illustrated several probable causes of failure in the original technique.

The comma of medium sized bitches compared favorally in structure with that of the human salpins for these experimental purposes. The outstanding exception was the mucous membrine liver in my opinion the endometrum in the log sould have resisted procedures de igned to produce stenose to a greater degree than would the mucous membrane of the fallopini tube.

The methol used in ea h experiment was composed of to procedures I inst each cornua was crusted by forceps in 2 areas therely forming a closed segment about 15 entimeters in length and a heavy silk ligature vas ited frinly around the crusted area. Second the lumen of the segment thus produced as injected with a sclerosing solution.

Nuncteen animal bided into four griups vere used. With the following exceptions the standard procedure described was performed upon each cornu. In experiments \$0.00 fol fol fol fol 151 153 155 the segments were tied tightly virhout pre liminars cut hing. In experiments \$0.00 252 and 161 and the ridical big with uture with seal to the list of the following the state of the tan fively procedure for cinquients of the control of the seal of the following the seal of the sea

mie ted into the cervix v I en the result as ques

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tionable lipiodal was injected and x ray pictus ere made. After the specimens we efficied ser all ections were made and studed. All specimens except the first 3 were sectioned longit thinally

#### CRU IIING

The importance of crush ng was emphas zed in evper ments Nos 66 69 72 173 173 175. The e animal represented o cons cutt e ligations it hout primary crush in of the cornua. All re est b 1 shed a patent lumen. The gross appearances revealed constricted areas in hich the h at reserve bursed. Visco conceller aminiations revealed

various degrees of replacement of muscle f bers b fibro s tissue in the areas of leation an int a endometrum and a distinct lumen of d mi b 3 caliber opposite the lature. An example w een in photomic ograph Foure 1 It wild anpear that the lumen was re-e tabl hed follo in atrophy of the muscle lavers which alloyed all ficient relaxation within the I gature to permit a return of patency to the lumen. In the remain 14 an mal repre ent n 56 l at ons instances of pate co th ou h the ligatured areas we e fo ni m 5 do s (Nos 304 314 147 250 350) hen crushing preceded ligat on (See Illustrative protomi ro raph No 314R Fig ) Ast di of these serial ections has led me to believe that the cru hin trauma m st ff ciently involve the mu cous membrane to in u adequite f bros acro-

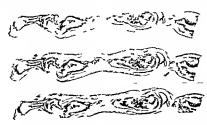
the lumen
Upon to occas in the rapid application of the
forceps to produce crushing was found to hear
the wall in the main ras to cause a small perforation through which the seleros green tecaped. This accide it was a probable cause of fixtuding in the original results of the seleros green tetuding in the original results.

#### SOLUTIONS

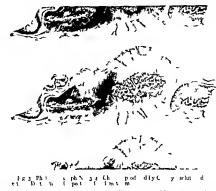
The solut on were njected into the lume of the egment with a No 4 gauge needle untl ballooning occurred. The tens on of the solution vas mai tained fo about 20 sec nds to prevent regurgitation of the solution through the

needle puncture

Quinne hydrochlo ide and u ethane were used
to i ject 4 segments (2 do s) sodium morrhuate
y as used n 6 segments (3 dogs) Camoy s solu



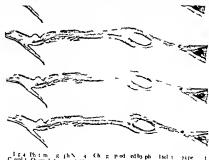
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tion an i phenol solutions were used in 14 eg ments (7 dogs) each. The effectiveness of the solutions was judged by the following micro copi-cal pictures (a) the legree of lestruction of the en I metrium (b) the degree of replacement by

f brous tissue (c) the degree of closure of the en tire lumen of the segment

Carnoy's solution produced the most extensive changes. In all 7 logs except 1 there was total destruction of the endometrium with complete



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closure of the lumen of the entire segment by fibrous t ssue (See illustrative photomicrograph No 314R Fig ) In the exception to 324 there was complete closure at the I catured a eas but areas of normal endometrium and a partial lumen could be seen. The cornua was greatly en la ged by estrus at the time of operation (Fig. 3) E amples of return of patency throu h the liva tured areas with closure of the lumen between these areas vas shown in photomicrograph No 314R (F10 3)

Phenol olutions were judged a close second The cha ges progressed more slowly after 1 jec tion and there were 4 instances when the lumen was patent through the h atured area (Nos 304

47 250 350) although cloure of the lumen within the segment was obtained in all rstances The 75 per cent solution of phenol was favored

(10 14/R Fig 4) Quinine hi drochloride and urethane and sodum morrhu te solutions produced only m ld a tions and were considered madequate

### RESULTS

In recel to ue occurred in my fit egm nts i llo ing ur tichnique I u som e e invol ed exter Il Iv a fev mi r he ions In the ectio s of dor to 13 ne of 1 uture vas found in the lumen of the egment Se etal do s passed throu h a pe iod fet s producing custic areas or had osalpinx in the we ments bet een the sutures or above them (Fig.,

#### SUMMARY

The experiment has demonstrated the f li

I Adequate trauma must in olve the mucous membrane la er in o der to produce stenosi I the cornua in the dog

2 The degree of physical trauma was difficult to gauge when induced by crushing

3 Th add tion of chem cal trauma prod cel a satisfactory result in all experiments

4 The sclerosing solution must be adequ to

Carnoy a solution and 75 per cent phe ol sol ti nere satisfactory Several causes of failure occurring o the o 1 mal technique of Madle ner were suggest d

Absorbable suture does not rema a in place a sufficient length of t me b Simple tyin without preliminary crush of

does not traumatize the mucosa sufficiently

c Rapid cru hing may cause shearing with it sultant fistula form t on d Hea 3 comual musculatu e which i presen

during pregnancy or e trus may lead to com t lete crushin

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#### REFERENCES

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## **EDITORIALS**

# SURGERY Gynccology and Obstetrics

IRV MAR II MARTIN I u l a l Ma ag g l l t

LOVAL DAVIS I DITOR

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SLAUFR I NOCH | MIGHAEL I MASON

DONALD C. HALF IR 1 1 to Dat 1 St ff

SUPTIMBER 1945

## **IHIOURACH**

THOUP CEIL is a drug of positive action in reducing thyroid toxicity but unles carefully administered it is a able of producing disastrous or implications and even fatalities. All information obtained by practical experience should therefore be made available at the earlie, t possible time to those now employing to a bledy to employ it. So far its manifacturers have supplied the drug entirely foresyx rimental u.e. Whether crinot it will be just on the market for general uses soon. I do not know but it comblete from information at hand that it will not be so wallable for at the it a vacar.

Dr I lmer C. Bartel of the department of methods of the clinic in coperation with the urgins in the clinic has n walmin tered thiourall to copitients with severe hyperthyroid mix hower, being prepared for this rill urvers and we have all watched the realts with interest and print

f time thiouracil has in our hand never

failed to reduce the metabolic rate to normal We have seen no patients in whom it was im possible to reduce the metabolic rate with thourard. Whether or not the remission produced by thourard in hyperthyroidism is temporary or permanent only time will tell. This point cannot be ettled until we know how many recurrences take place when the drug is withdrawn and how long the patients in whom a remission has been produced remain in remission.

While we wait for this proof we should take advantage of the fact that in a patient very ill with hyperthyroidism thiouracil if ad ministered over a long enough period and in proper dose will bring the metabolic rate to normal. The patient goes to operation in a nontoric state, and recovers from subtotal thyroid-ctomy with as little postoperative reaction as occurs in patients with nontoric adenomas. In other word, with the proper administration of thiouracil fatalities from only rations on toxic patients should be eliminated po toperative storms should disappear and multiple stage, thyroid operations should not be necessary.

We have learned that thiouracil hould not legicumules the patient can be seen at least every ten to further day and blood examinations made against the possibility of the onset of agranule extos. At least fourteen deaths have liken reported in the literature from agranule extos is after adminiterature from thouracil

Letter have been received from surgeons in all parts of the United State who complain bitterly that thourard makes the operation of subtetal throudectomy difficult because after it is used the gland become so final let that it i impossible to central bleeding adequately and

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### PHYSICOCHEMICAL METHODS IN SURGERY

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#### SURGICAL TECHNIQUE

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# ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

#### EYE

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A cries of 33 cases in which repair f perforating corn also and as a scompil shed by corn alsutures sempared to a group in which c njunctival flaps sere us d. No m nor perforations are concluded and all cases studied wire without a retained foreign

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## SURGERY OF THE NERVOUS SYSTEM

#### PERIPHERAL NERVES

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#### BRAIN AND ITS COVERINGS CRANIAL NERVES

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HERYA, SHE KI MD

Dikes n W. W. Characteristic Roentgenographic Changes A oct ted with Tubero's Sci rosis A & A P 3ch at Ch c 945 53 99

Two typical cases of tuberous scler as were completely e mn dt to determ ne the location of the chiracteristic areas of calef cation seen in the rot type grains. But the tents were dot swith long has ness i con will be setures with a bacco a case of calef and it apost and the characteristic cases of caleful and it apost and the characteristic area of caleful and in e.c. in a small with go during the case of caleful and in e.c. in a small with go during the case of my small with good my small with

II ti la lat ftl t the sl 1 gl s R tg g tl 1 fth p 'l t as sho tit the roctge t calp t to t i t d the skull ray am at of the t d bran aled n the n the a fh a s f ce edd as tyn the skull whe maned ht i g cally how d hyp r stos f th n e tabl and f th t becul e f th d ploc p ces Th cal tum a als fu dt b fdmm hdthcles May fthe sla ds of hyp t s s 1 the kull

lay t b t u nodule in th b lco t ADRI VER

Il ft tt L Sm lk E A d llu l k P f nt l Lobot my n T tm nt f Ch nc P ych with Spe i l R f nc to S cti n f th O bit l Are a Only d k \ P f ut Chi 945 53

Th a thor deddt limit th p at a fpr fr ntall b t my to s ct n f the rbit l g on nly or of th l wer q d ants f the f tall be Thi s d ne with the h pe that it wild p t he fie the te t menta dal rest ict the at tofd truet on a d p top at coul 4 b rr h le as ple d 5 cm abo e the y materh d 3 cm p t o t the late 1rm fth bt Thetp 1 th e trel was I cated a d a cut m de n th to the was calculated a cut more not not consider the theorem of not the fibe ent cl fom the levil f the burn hiedo a d This proc d rew ca do this trib.

Twick two pate ts hope is hid he

judged shaig ery poor p mos we sub je ted to this modifi d pr cedur All h ve b en fllowed up for a p nod of telm the of fte peato. The odtn scsded much mprod hathept at old cume hs oc l ctyte ad tra to bal m levi f ccunati n It was c n id ed as imp d when the pati t a able to make better t tuti n di stm nt d lightly imp o ed h n he b t tutan l cam ale strubl s men run or u t dialp bl m Thre pat ts ffen gim ffete et n types of ny bs ad wh pr uh bdhda a f metrazol r le treshekt atment

eoperated p To 1 the b th tat dde pr sed 1 di d is we gr thy be bt d Th th dp te t wh hadb a nacho m st t w she efited uffe ntlyt b eturn dt h rf mily On patt t ith obsess ompu! ne who h dp vi l) not e po dd t 7 met 1 el tric shock tre tm nts g tly h ft d
Two n urasthe p t nt both f whom had bee treatedu c s fully w th ul na dm t 1 el ctric shick pripe tiely er rith be fited by the op rat n

Of a pat at with epilepy dipycho all of

wh m e perated po was g atly b efit d a dawe oly sightly b n fited by th p ed e I the shiz ph ne gr p the co dit n w s m ch mpro d' 7 caes smewh t mp ed if lil http pel t j dio hith pel t j dio hith pel g j h dth h h ttfep tpati

Itlifet's plettese u ! It I f m the proc du to d t Tra try ;

t c de 1 p di 4 fthe 2pt nts hom nly th f erq ad ts w secti n d as opposed t 4 f 8 pati nts n hom Il 4 qu dra ts wees c t d Iwo pat ts h d m ld transt ry h m pa s and n thers there s mak d nte centh peh but the also a trast n Pstprt ecufu nanidsr tatun rn i qetiv bered dhadn effeto the cm Mete alepn snth first pstp tely id otaffe tth u cessful out e me of the paten Imprem toccured the a fe cks or fee as lo s ye r

I s mm ty a pot pet revry ate of a preet a bta dar ult compriav rabi ath the a rate of coery (3 3pt t ( 17 th r clin cs The rede ee f tra t re not peratveu ry c thene wameh! ad p stop atied light nd lwgup e lap ou cel with the mod fid prat It clddth t sat fetry the ptees lt pa tnts then talds ders sbtil this t noftheobtal uf sin dthatth ob a a f the fr t libsb liegult d that th o b tal of them to HER A SHEE MD

Cohn R El toe c phalographi Study f Pre f nt 1L bot my A St dy f Focal Brail jry t h \ P ) h t Ch 945 53 85

Chnered tilt ephalg phestd on pate their difter fontilobimy rd tidt m the dene fieblid mag

dhow thise demyhlpt it pet lect e phal gram in leedet ttum Thommod t bomlite e pholog phe esponse to prio tall b tom find (f t line of mity with the act mil o I lisub peets f m hometed gs etkn with t dys fer peaton bgh oltg sl w es w bere d n th symm t cal f ont ll ds W thin n to theem the ft operat the prom the free cy es (t 4 p ond) were te pledbyshrtsques fope ecodwes f ducdampltd Inmot by tath lowin tnsty bomalty praistda a bdm nat brete iste as lgs cdgs er m de 1 3 ubjects hmth rit tod gsw m d that emoth ft pe at a bnorm md that emoth ft peats borm leftms we roog d I ded lobot my add the rplacement f p pet high! q nes a es b rm l'appe g lpha a es

R rs on t the perat trl doc Hypers that gr thy cc tutd th lw f q cy ch te tes f the let or ceph l gram f l b t m d d duals h h p pers t is e nat cdby mlaped

It endent from this work that old e I ral fe s my ree to focal and ge ral electroencepha I graphic ch ges and therefor th p esence of promin at electroencephalograph e abnormal ties with ldh dil nes m t be con d das being causall related to the c r bral damage

On the th had the tudy alo h sthat th p esence of known ce br l damage (acute or chronic) I etroene phal graph cabn rmalities m ;

be m n mal h ent

The effects I hypersentilat n n the ef ctroe cephalogram fter injury (lobotoms) demon trates that n uronal d t rhance s an impo ta t factor in the product on of sl n na es d ri g the proces of deep b c thing. This el ar fi d ng makes it necessary to partially de-emph use the r le f alt ration in the blood ugar in the poduct n of I w waves d ri g hyperventilat

HENR A SERVER M D

Meyer A. It Meni gococcal M ni giti AR port on t65 Cases A Int 1 945 2 543

es of ea es f meningococcal m a giti w old red in the period f om J 1 1942 th ough 1 o ed by di ect mear or cult re. The add tional is cases we encluded beca e of the pese ce fa purul nt p nal flu d nd their occurrence in an ej i Im cre od Th erall m rt l ty rate was 3 per e nt fr the pos das ca es it was 4 pe cent Six I the 9 deaths occurred the test two t f r hours of hospitalizat n On de th res lted

f mt ded lay in diagnos s nd 1 d th oc curd fter adeq te treatment Th raps connisted from f od um ulfad me

gi en intra nou ly in a l ter f phy 1 cal 1 e soluts n f llo ed by 1 gm gt en orally en f h ure Ast much tube was util z d fo m dication a d the gigffid during coma A flud the

er gi en n itial dos of sulf diaz e f gm kgm ra enterall followed by oral does calcu I ted nabal f agm pe kgm Th II da e l lood I el was maint ned to mgm pe ooce The s if diazi e was u ualle d cont n ed o th noth d ft atm nt. Th ni drug act no

9 n.t nces ime oscopeh m t na Me gococcu a tt xin wa u ed in ca es l l g t respo dt sulf dis new thint enty fu h is n' ce of 2 rwh lm g f et o t h

n te l ďm n Antit was ed n 30 56 per c t i li ca es In patient und t rs of age th a rag doe f t tox non ts th I gat dose be g so ooo un t t ats rfrt s re 11 th rag d× u ed a 5 000 ht th 1 rest be g The nut nm he nut nw g nulvanihali ntram cul i gl l× h ff tra

R peated 1 mbar pr t res m r m d t creased intracra tal p < n I cat 1 b ratory it rat as ado intra t ti h d h rrestles ness The seq lae r ()rlpect

subs quent r co ers () feeration of a ma i e p rours in a patient with an overwhelmi gunfect on on adm so who reco er d (3) q adripl gia and respirators paral s s coes fully treated b means f a respirator and 1 mb r punctur ptosis of one eyeld a d unilateral optic atrophy (c) a eptic purul nt eff sion, into knee j int an i r a ept c purulent pl ural eff ion all end g in r co ers without drain ge (6) z in ta ces i q es tionable had ocephal s in infants and (7) a h m plegia in a fits nine year-old h perten e patient HE BY A SHE KI M D

weeks afte dich g : a th ee ear-old thild ith

#### SYMPATHETIC NERVES

Sil rm a J J and Pow !! \ E A Simpl Tech nique for Outlining the Sweat Pattern !! M d Chc. 045 7

I new technique for utlining sweat patterns is be fly describ d Th authors had previou ly de





15 tpattern fith pal dem trated th tech q I sph gtan and dreth t th L B dem tt f nds duals tdojit fre ma \* hth sam techniq e. C A th tern d m trated by pg l t on of tan and

Ilticla at 1th 1tl 1 tn gl Ratgng l fth t a li acht a t) La f tl nith br

ho that ti rounth t l calp l intd thiskull a smator fth t d ba ecled the nether a fhaeas I nereas d dens to 1 th sk li whe s mined h t log cally h d hyp r t f th er tabl and f the trabeculae f the d plo spaces The cal varium a als fu dt beofdmn hdthcknes Many fth isl nds of h pero to 1 in the & llo e lav t b r us n dul thec blot

١ ٩n M D

II fstatt L Sm lik E A nd B ch k Pr I ont l Lobotomy in Tre tm nt of Ch i Psy hos w th Spec 1R fe en t Secti n f th Orbit l Area Only A h \ Pyhat 94 53

Th uth rad c ded t In tth prat nofp fo tallohotomy t sect on fth bt l eg on aly o f the l e qu d ants of the fr taff be This a don ith th hop that t ould prot be flect t atmenta i loc tretth t t fde tructin ndp t prat sqela Aburhl splaced sem b the vgomati a ch d3 cm p ster or to the lat r I m I the orbit Th t p of the vinticl was I cat d and a ut made nith tonal place to the doth from infrat fith tip f the vent icle from the l l f the burholed n

d The p edu wa car ed out bil terally Twe ty two pat nts bo pr vously had b n i dg d as having a ry poor p o no s re ub ted t this mod fied pro edu e Alf ha e he n filled pfrapprod ftwl moths fgraftropatn The dato a osderd much mp d when thep to to uld es m hs clat us and rt mt hs form feel f oc up ton It a consdit das mp d when

th pt at ws blet mkabtt stituti al adju tm t a d sl ghtly mpr ed when h b c m ales tr ubles me urs n reust d lp blem The pt nt suffering i maffet reat n t ps of pschoss and wheprosly had had a erage of 12 metraz locletre shock trements

r ope ated pon Tu of these b th g tated d p es ed urdt idu is w re greatly b nehted. The was benefited uffic atly tob turn dtoh f m ly O e pat at w th a bs s e c mp live eu osis who b d p evi ly not r p ded t 7 met a lor

1 tr sh ck tre tra nt a geatly be fit d To n urasthe c pati nts b th I whom had be nt eated un ucc s fully the I ndm tr z l r lect ic sh ck preop at ly w rege thy b

fit d by th op at n Of 4 pat ats with epil psy and psychoall f

whom n re perated po t a greatly b 6t đ nd 3 w only slightly b nefited by th p In the schiz phe grup the cadt a was much mpr d 7 ses mewhat mp ed

4 a l sl htly impr l out to hold the first ni pr t at f hi th jaa igr ph Ith bh ult ft th proc due to dt Tan it ry

trt freg ns t peat lath if ct ns rplptese u h ;

tecdifplisofthe apat ts hm o ly the lo I quadr nts r s ctione I as oppo of t 4 f8p te ts 1 whom II 4 q adr ts eese t ed 1 pat nts had m ld trans t ry h m is din others the ews maked to the p ch but the als as ta top I st p at e conf o and ds r ntato we a fr ie tly ob rved nd had n effect on th o t em Metes ad epniens on the first p t p rat e day d d not aff et the v ces i l ut c m of the pe at n Imp o eme t occurred with a f v cls or afte s lon as a) r
In s mm ry ap t p ati eco r) rat l 4
per cent wa bta d a res lt c mpa gf v rabl th the rage rate of recovery of 31 3 pc c tof 7 oth r clin cs Th incidenc of trans t m p t p attentinary cot nce a muchl j potp at ed ll g d low gup el pro-

o ne d with the m d fied pe at It a c fud d th t a sat sfa tory th rapeut cr It in pa tents with mentild rder a bt ed thic to of the beal surf c alo nd that the bt I se sof thef tall bes ha a rol neglti of the m tron HR ISEM MD

Cohn R Elect oen ph l graphic St dv f Pr frontal L botom; A Study of Focal Bral 1 i ry A h \ P; h t Chi 94 53 83

Ch caredot litencipal graphe thes apt tabir ditrpefotlibet m f rd t dt mn th l e fc corldamag and h w this d n m y h lp to t rpr t l cto-enceph l gr ms n ca s i a c d ntal t ma

The mm date be mall ten phatograph espons to pelo talf bt my feal (font) n conf rm ty w th th a atom cl on In all bjets fe m h m eco d gs taken with a t a dys fte per tahgh oltg slwwaes e obs re d in th ) mm t ical fr ntal ) ad W th

e to thre mo the afte per to n the pomin t f fequency es (to 4 per se d) were pleed by hert quency fope se ond waves of red c d amplitud. In met s bj ts the l wen t ns ty bnormality persisted a a subdomnast chrate tic l ga cord os remade In 3 s bje ts in whom the ril t cordings we

mad with none m the fte per to n b mal ded the r plac m nt f pepe te hgh! q nes wa es by norm l'appears g lpha a es R ron to the p ope at e c trire doc curd n m th late

If q c) ch ract tes of the electroe cephal gram I lobotom d nd v dual wh h p coner t els ee nfl cdby a sim la pr cd

It; evident from this work that old c balli ns g ve r se to focal and general el ctroencepha log anh c cha ges and therefo e the presence of from ent el ctroencephalograph e bnormal hes with old had int ies must b consider das leing c s ll rel ted to the cerebral damage

On the other hand the study also sho a that sen in the pr senc of known cerebral dam ge facute or chron ) electroene ph lographic abnormal ties may

be runimal or b ent

The eff cts of hype entilation on the electr ncephalog am after injury (lobotomy) d mon strate that n uronal dist rbance an important f ctor in the product n of sl waves during the process of deep be athing. This cl ar find ng makes it necess by t partially de emphasiz the rol of alteration n the blood sugar in the prod ction f sl wa es during hypery tilat on

HE RY A SHE RI M D Meye A R Meningor cal M ningitls AR no t

on 165 Cases A I t M 945 This se ies f cases f meni gococcal meni git observed in the pe god f om J by 194 thr gh p oved by dir t ame r culture The additi n 1 5 ca es were cluded beca se of the presenc f a p rule t pinal flu d and th ir occurrence in an el lem cp od Th ov all mortality r te vas 53 p r cent fr the p oved 50 ca es it was 4 pe cent

f the o d aths o curred in th fi t twenty f ur h urs of hosp t luat n One d ath resuft d f mu ded lay in diagn sis and nly 2 d aths c

curr d ft adequate treatm t

The rapy c usisted of 5 gm of a d um sulfad azin given trav ously in a l ter of phys l g cal l e follo ed by 1 gm g1 n orally ol t hours Ast much tube w sut hized for m d cation nd the guing ff ids dur g oma Afl d at L fat I st g lt rs da ly was m intain d Ch ldr n eegvena it I dos fs Had zi of er kgm parenterally follo ed by ral do caf ted na bas of zgm p r kgm Th ulf diaz e bl od le el as maintai d t io mgm pe oo cc The ulfad a me was usually dis out nu d on the inth day of tre tra t Th only drug ere gin tan es of mer e pie h mat ja

Hen ngococcus ant toxin wa u d ca to respond to s If daz n w that enty f wh n evid nce of an o en helm ng nf to 1 as n ted nadm sin Antt 30 36 per ent fall ca es In p tient rs lag th a aged e fant town

ts th l rg t d be g 8 coo nits lin ja ts v r l rty years old the erag d d s 5 coo u t the l g t be g coo un he antito i g n i a s ngl d s h lf i t ooo un t The antito 1 nou l and h Hi tan cularly

R peated lumbar p netu es er mad t ries sell trace malpes tanh til

purators alt rat us and/or intr ct 11 h d ch or restles ness The seq clae we ()rlpet o

week after d scharg in a three v ar-old child ith subsequent recovery ( ) ulc r tion of a massive purpura na pat ent with an ove whelming infection on admi sion who seco et d (3) quadrinl g a and resp atory paralys's successf lly treated by me n of a re pirator and lumbar punct re (4) ptosis of o e eyeld a d unilateral optic at ophy (s) asept c purulent effusion, into knee joints and I a ptic purul nt pleural flu ion all ending in r co ery w thout drain ge (6) instances of ques tionable hydroceph lus n infants and (7) a hemi plegia in a fifty in ne year old hyperten ive pat int HENRY A BENK

### SYMPATHETIC NERVES

Sil 1 man J J and Pow 11 V E A Simple Tech place for Outlining the Sweat Pattern II r 31 d Ch 1045 7 178

A new techn que for outl m g sweat patterns is briefly desc b d The authors had previously de





A Still Ith pland nstrat 1 th tech q f pply ng ta m cadd ctly t th B dm trati food vod is td di t t b th th sam t chnig tpt tern d m trated by apple t f ta

cib dam thod for showing the swat patt min the hani and the new in thou as an adaptat nof this one which is suitable for u e over the retitate hody. The only chemical used are alcold I time acid and free cholode. The first hird district with the parts of alcold land applied to the limit of acid to the pred applicator. This evaporates rapidly all a cas ado, unfa estamod hilly with ferric chloide. An tomis rithen so did not be read as the seat of stiff of the control o

### MISCELLANEOUS

Lew y F H What I th G II n Barré Syn d om } J P d | S L | 045 6 65

Th autho po t ut the conf sion which e sts nibe classification of critain polyneurid's polyneurid is polyneurid is not proparable of radius of paralyses of radicult on pin linatur. The ecent tend ncy his been to includ all if the econdition of the so call difficulties in a ryndom.

Two case h tore repr s ntati e of the Gu llain Bré syndr me a d bed as ell a the hist patholy galfindi g Aut p was d n oo a child who ded u e pe i dly in the lo rth we k of th dieas fr m n a ute deg nerati n f th phren a r

A compa o of the sac al nerv o's in these a cases w made p sibl by perat posure of

the sacral roots is the second cas which re exs often adherent nerve roots is much cheert is were removed.

Patholo really peracute rad culopathy of almost n c ot c n in e was fo d The myela was pal to be complet ly dis oh d while the xis cyladers were fragmented.

Firth rextenie in of ment as demonstrated in the child at autopsy as the phrence resshoot as go of active traits in evid cooler braiss in nite etical dera gement ecross in the antenorms and digeration in the white matter of the pill a child of the eod times had failed to

p d ce cln cal gns
Theo g at conc ptin f th Guillan B r é ya
d omewas described a as r but e tu llyb ge
polineu opath; with pr f r nital no lem nt of
th mot r n rves a d albumi cytological o c

ton the pual fluid

It was point d ut by that n 1937 G llain
himself e old d the pin w thout a y rese
at us whate e er

The sug str n s made that the dess nation Guil in Barre syndr me ber ta ned as g ribe ding for the v u forms of polyn cump thy and ad culopathy I tak n wn tolow w that with e croachmet po the cuntal nervous system a da part I blo k as d cat d by the album nocyter lo real d sort to the spiral fl d

espialit d Hoar ABown MD

# SURGERY OF THE THORAX

### CHEST WALL AND BREAST

Big RE Samu is LT and McCa tney J S Th Teatm nt of Pubert i Bil terai Gynec m stia S g y 945 7 397

The authors eport a case of bilateral gv e m stia devel p g at puberty i a sixteen y rold boy It was ssoc ted with little be rd de elop me tand ome vide e imprprrsub ormai t st cula function The 17 ketoster d output w s los Admi istrat on of testostero e da ly f thre weeks deer sed the olume of th brea ts by ab ut 50 percent while the ge I body ight int ased The cetion of 7 ket stero ds was allo mer as d The thang in the gland appea ed t be decreasing with time h weve a d surg cal rem al sort d to

The h st logical p et re s that of chronic fibr s mastit's The case appears to ha e been anothe of th sy dr me described by kle nfelter R fen tei

and Albri bt

c siderable r duction in the size f the W bil brea ts can b p od ced in these cases by int nsi e treatment with te tost ro e the r sult is not n t rely satisfacto y probably b cau e f the norca ed es dual connecti t su The surg cal appr ach to b p fer ed And ogen therapy can be used s b

s q ntly I t se ms 1 dicated EARLOL DE MD

Biddi A G fmp ed B e st Lifting Ope ti n
Am J S g 945 67 488

The winor peri m bis breast lifting per ti u dr nerv block and this a dlocal infiltr ti n abo t the n pple f ne es ry The w l cat on of the n ppl 1 m rked by m a s f a triangle wh b plcsth ppl s q 1 ches apa t and n th thi d e stint rspace. The first at pin the per tinit to tac clar u d the a e la ith then ppl sacent. The doe by meas first ical cut ti g po nt plac d a compa s I the uthor A rtic in o 1 m d f m the fow f the i esi ns down to the h t bo d " The knin to uddfom thent u f f the be t caebe e e cied not to p tu th skn dt i llow th i c of leava e Wh th sk habenseprt deomplt lyn ildret n th Lahy , ite clamp ar sdt bld th glad wet ll) The fat sthe r mo df m th beat whe tl brattssu is g ath, rsizd ky et ? wh ped s cti 1 x is d f m th uppe cen talp tin Othe ect nsaerm dince The gl d s sutu ed ts p p r pos to oth kinf shoeda udit dutu d

Th fin I step is to bri th n pple t the rf c ı ts location The 1 ct 1 c tt g por ta d re ga s d A p n g i ghtiv ia g mp th th rg I reolar 1 md 1h ip

ple : sutured n place with fi e s lk sutures Ap es s re dressing is then applied EARL O LATIMER M D

L m at E S Pl stic Surgery in R con tructing Enlarg d Br st S g y 945 7 3 9

The author uses thee typs of preedue fo m stopey according to the i divid al ca e

The one stage mastone y with tran position of the nipple may b used in the majority of patient with enla ged hyp troph ed b easts. The lines of nersion are carefully measu ed and ma L d the d y one to operation The init I inci ion is c rular a ound the a cola From the cent r edge of th s incis on anoth is mad perpendicularly upward to the ne nipples t The skin I the br ast is und mined in a thick flap in the plan of cleavinge Th breast entirely d uded of skin with its n pple and a cola ttach dip h dup to the desired positi a on the chest W dges of breast t sue re emo ed until the d si ed size is obtained F llo ing ec n structi a f the b east th ee heavy silk sutur s are t k n th ough the pect ral fasc a o er the sec n l rib ca ned through the uppe poles f the b east Thus the br t i secured in its n po ition A circular button of skin pr vio ly ma Led to serve a the new locat on of the a col and n pple is e mov d The css iskin i remov diom the skin flaps and the skin dg a e app o m tid In re constructing the opposite brea t car is ercised to cre te symm try and s ml ity bet en th t o breast

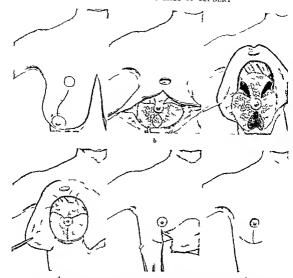
in m kediyenlrgdbr t to tage op a t on ith a ppi tra pl ntat on may t the method of ho Ins cheat the cicul a ca hich is to be the ec pi nt hed for then ppl tran plant sea e f lly measured ad m rked An inci thr gh p rt of the derma and the skin is di sected fe tof at bed fo there ptio f the nipple and ts e la An incis on is made ar und the a c la f li gapr rush malderele and the true tur is dissect difree alm tas a fill thickness g aft The nppl a dereola a e transplant d to the n w nd a su table press dre s ng 15 appl ed Two

as i te the s cond stage 1 car dout An in en on is car ied d wn f om the conter of the trans plant d u ppl a oth mci n is made alog the nder urface I the br ast Tw thick k n flaps

cre ted Th r q red am unt of breast tissue esected in the form of tria gula w dges. The Lin flaps resh ped and ppr x mat d in the form

I an v rted T In cessi ly large brea is that ha e hypertr phi d and retained an abund nce of fatty ti sue two stag ma topexy with it aspos tion of the n pple is carri do t in incision is m d a ou dth

ola the des d m unt f mat al b g re ti d for tansf From the ce t



Fg Ill t t dp t g the modicat f the tag m t peny f Th hes f c h bee refully man d dm keel t sh t th n w post if the nippl the munt f oda t be transfer of the 
dge of the releant and a can of proularly part with hill nh fish in polt Finth lor ntrifthed nen t Finth lor ntrifthed nen cared perpend larly i add the fr mammary lin A other n bout om I cared of the nin minural t fin antil Oeturg lades f

wig f breast has set d dth q ed and t fast lith will all withe astrone t beat which astrone t beat which deat d m bee and jumper on ed D Th be at tu make the set of 
br t m of m th ppep le The k

v th bat norm need th kip t n

j t b lo th l l Th pp pol fth

hr t fi d w th th e lk tu to th pect al

fs the d nb \ necular caf k

m ed f the new ppl d last d th

ppl a da la caf lly to plate Th

e cess of kin fr m the apr n il p remov d and the edges ar sutu el \ Pennos ed ain i use ted high ato ither co ner of the vound To weeks later th previou lime f inci on long the infra mammar) hie is opened and i om its center dee nincs n i made p a d to the cent r edge of the are l to form an in et d T T o theck t singular flaps are cr ated to expose th medial and lat nal poles of the breat T or three triangular a dges

It beast are remo ed a d f necessary a semicicular section is mo d along the inframamin ryreg n Th rq red mount of kin is rem wed b th from th c ntr f ach flap a d f om its n fer o port n A Pen se drain is placed in ach angle f the wound r 10 Armers MD

### TRACHEA LUNGS AND PLEURA

II yw rd J l The R m val of Blood fr m Tesu m tl Hem th races A l l \ I I nd J S 1 945 4 57

The a thor d case the m mag m nt of ex es of traumatic benothorax in the he Guin a battl if t Th is still some contro eray as to whith or not tenl hemothor ces sho ld be sap rated. The a th r b le es that the a guments against asp a t such as the int d th no finfect on the sting if resh him bage in the splain gelf of the blood on the lace at ed lug have be nefeat d

Blod my clot n the plural castive moss as do die nt dig see varue from hot that of fab mt a large coagul m fabrus. The flot contents of differ t local may vay; color and c misterey. The clott cast vans from e set case and it is but a stata number of f ctors at lay Thea thorn 1 e stata the factor infect on

is a important one

Blood may be rem wed from the pleu al cavity by vanous into the sape ation it is could take draining and by rib esect o a delosed lata ag. The case in New Gue e treated the properties of the same and 
FORREST D DO RILL, M D

Th m C P nd Clef nd W P Dec rticati n in Cl tted d infected ii m th ra s Ls t Lo d 948 48 3 7

If m the by f the comment est complex tendent; nest from who associated the nwifth ratipes of injury produced by ablating will grad to the perfect gand protein grad to the comment of the

O emutdiff tit b t een a mil h mothra whch them the most import t fit f an ajry d the mpo nd o c mil c t d h m thorax wh h th pl ral blood i s cated tham e tus mpo t jury t h lu g

d aphragm or chest wall. Alm t ll l th latt r type of cases require acti e su gical tre timent. Th associated hemoth rax if remo ed at the t m of operation rarely causes further serious t ouble. The mple hemothorax presents rather a differ in problem for with adequate treatment it if liss ill y

le apidl and completely How er the more tall to and morb dity in these cases depend almost entirely on the occurrence of infection or mass

clotting in the hemoth r x

The xtens e straple ral use of penicillin has un fo tunat ly been as octated that endency to disgard the p nosples of early no frequent aspia a tion f blo d from the pleural cavity so that m ny cases ema a virtually unaspirated for a considerable period

The faily distinct types of clotted hemoth there been necontered On shot s rentgenol girally multiplipockets and bad or sheets I filtram The pockets a often shift if in mach other ndth ir c nt nts m y vary from st ril ser u fluid to frank there are not terred is the main to the main to the same than the same transfer of th

clot In the stype the clot susually in one piece or relationly small number of piece a sometimes

ghing as much as a poind. The different appearances if the totypes a c

duet the pessen of sar in the pleural cavity in the by tages. So chair may have come from the lung rithrook the cound on it may have been it due dit in the lall of eng an replacement. It will not like the large specified by a acrobe of gamssim can hilly account fit the difference as mann multicult case a estel while infection is a man ieclt in the gaffirm no granium signers to a specified propertioner or continents granify Gas

fo ming org in ms u doubtedly acce t ate the ap pe ance of the multilocular variety

Th phys cal signs of the clotted hemothorax are essent ally thos fpl utal fl d In the multil lar

case r a f tympany and duline s may alternate B cath sou ds a c us lly bent but somet m thy are present a 6 then ar bronchalln har cter Tho occur ene f br uch 1 breath s unds d p nds n the st t of the und rlyt glung thy are most s lly heard who n the lung; at 1 ct t c

The ontgenol goal features a sometimes is that e b t are commonly the same as a nay place rale off sion. In the multilocular cases the appear not multiple fluid! else character sice but the condition as you like the shadows the way by the lime tany t act so that a daphragm the hermal my his uper to Later case with massic clotting his about the place of the condition and contraction placed and smill city may so and contraction placed and smill city may so

um ano al ph cal shape r embling a che t all t m rora periph lg th f the ling

Th final d g 1 of clift; g d p nd n the g nability to a 1 rate blood nr aso ble q tit es with an aspirat g needle. Small quint tes of blood can be aspirated e en whin a mas we clift in present because a hittle fid blood is shit offinion.

cult in the 1 t To often the a pirat nof tv r threounce fill dblodha I dto the us less con t nuanc I con. reative t time t with unfo tunat delay n the mplo me t I mo e acti m a ures The mability to a pirate blood from a hemothora does n t al avs m an that cl tt ng ha courredth a pirat n s t may be too lo because allo ance ha not ben made fr th u ual 1e in th d phragmaiter njuri too small a e dl mai b empl jed o the needl may b repe t dl blocked b sm lifibr stag fi tog n the flu d

Much blod can unq est n bly be abs rhed from the ple ral cas t but en in min mal cases the e s a certa n amount of o nizat n and the o stis e i rm ton In the cas flagre lectos e nid e abl tib us t ue fo matt n cours the may frmar i tant cr t oft nan inch o m te thick a o nd th lun and b to en t and the chest wall t pr duce a cond to n s itably termed the fre en ch t Og n zat on n th fibro s tesm format on oc ur- with great r p d ty n a hemothora and appa ntly takes place earle and mor tn\_e

n clotted ca es

nd complete bliter t n 1 th pleur 1 p easth m t mpo tant single fact r m th pre nti n f pl u al ep s and its elim nat n nhen

e establ h d

Eal rm th d f treats g clott d hem th races attended by incomplet or cons derably de-I i dlu g xpan ion At the best uch methods led to c n d able deformity f th chest which in late hi caused vere pir tory embarras ment Less fortunat pat ents were left ith se ere and p o Ingd ple r linf etin heh as lag ly r sp n

ble f r the mortal ty at the base b pital The emplyment of decorticat on with 5 ction dr mage f lfil the bas cp i ciple featly a de m plt r xpans on fthelu g The author fe lc ta n that the meth d will redu markedly both the

mo tality and the me bed to of this go p I cases
An interceptal nest relateral aid b through the s th sp ce with rese tion of a segment of the si th rib poste i ly is emplied to all but the sm il locali ed ca e in the latter go p the inc s n is placed r the affected rea Good wide ac ess is e sent 1 if the ap cal and diaphragmat regions are t b r ached asily Blo d and lot ar first rem ed from th ple r I cavity The lu g 1 then found enca din a d m oth membran littl o n pr tory e cursi n This m mb an

ca f lly n d unt l the gray sh mn lay ise alplur ise c nte ed Aplan fel ead is fund betwee the plu a and the fib us coat and the l tte is ca f lly em d f m the I ng b bl nt d: ct on w th the finger or uried hem tat e th relo ed r with a mall swah n its ta Cemut be takent and lac rating the plur btanumb I small t ars seem n to d ble It 1 d is ble to try t m e the co tn f m th 1 ng mm d atel adjacent t a lug ond whith baled or u heal d fort do o mrly es it n consider bl pulm nary lacerat n

Allic at n of th plua ther traum t operate e hich till perm t the lak col nit con I on I the decorticat on shiuld be tired with fine catgut If the daphragm is cove d ha fibr u t sue coat this co t should b rem d the cost ph ni sin s refo m d b beaki gd a the bite at ng ad one Th fibrous coat go th partalplus hould then brmo da co plt it as posbl The soften difficult at t pu ely mech nical a on

Int reostal drang tubes ar o in this th ap cal and ba al reg n of th plu al ca t The ap cal tube is insert dth o ghthe highesta abl intercostal pac bet e n th v rtebral bor r of the scapula and the ve tebr I column while the ba I tube (med um h re ta ht tub wihas k bl) as se tedat th bang! bout ich im the I e lim t of th pleu al ca ty The thorac t om wo id is thin clo ed in lay rs

Ding and aft the operation t fu n f hole blood a mployed f m z to a pints of blood ar usuall n ces ary b caus hock may be se the patients a coft n poor op att crisks and h m rrhage may h s gnincant but a rarely

P ntothal with cyclop pane ndo sgeng a by the closed point e preside ntrat halmethod bash enu damo t cases Whathe fot lasha h ninge nito so ide ovegen a detherha e

plac d the cy lop opane

οč

In the first place and to as I ag as dem a trable bronchopl ural fistul are present b th t b at onn cted to w to ealed bottle When the fit Ish v I sed-u nally betwent live a d thirty six h urs afte op r ton-b th t bes are on cled hi a Y shaped conn tin to a clet i set numb The pres u ed c das ap dly as ca b t I rated to 50 6 cm Hg In no cas sho lds ct be st rted unt I th pat ent : propped up o pllo alte the ope ation If sucti n is start d i ben th pat at is h riz at I th re danger th t the uppe lob may seal the pper cath ter and 1 v a nt mor p cket fair sh t off f om the tub S ct on man tainedf thoo the dy ndwh ntheles is fully expanded the tube at 1 mo ed p ca to me h ldb tak n to e that no a fi k aln th tube tra is afte emo ! f the t bes

Hem th ac ccurding 6 (70 perc t) f the

ca es ma res of 750 hest ) r pr nt m 30 per c nt and clitta Infect nwa gpe c t i JOEBK NAR the bemoth r c s

Farnly GR Bit Injeyt th L g Bnd M J 945 474

Fp ment it die hae I d that the path I vdet volos biat on the lugs me fest d b pulm ary h m rrhage of my g d gr es of s rty fom mall cap ll ry s rfac bl d gt omplete hepati ton f th I ng These les out em t be ca ed by th force of p ti e p es a di ectly on the he tw ll

The pes at epot tain del nical analy is ! such cales c ed at a base hosp taif out to

## SURGERY OF THE THORAX

## TABLE I -SUMMARY OF CASES

Case	E J so ce por	T'm sci	P	Co gh	H mo ys	Signs h	∜ ford go i h
_	A rusl bomb y ds P on		d 05	days	h days ma	1 d 5th 7 h t days	Aldeb b sh
_	M bomb 3! Fac ng	8 h rs	gdysreros es l dy pe belm	d ys blood	h dags 10term t	G 1 h hı 3 d	NI did h b h day
3	A rial bomb		gda ros na l	8 days m d pu tum	d ha t	C nos hype pa dg Ih h da mi dda la	1 deb bdys
4	Lan i mi ds Lef d	5 m 112	d yn righ hes	days m	h-o h days	Al 3rd, 5 b 9 h days	N14 h 7th d vs
5	Ladm lon Spi		6 days or mil	5 d ys blood pu m	5 h d ys	∖1 d, h,7 h days	16 h h days
6	f ta bomb ya da F	2 jr 12	d whi	5 day blood	d bd ys	G alized h hi ds ud 3 d 5 h 7 h days	\1 3 d 8 h da
7	M bomh	h	7 da h l hes 1 l rm	3 d ye	4144	Ge alzed h h da i3 d s h h days	N1 3 d 5 h da
•	M rta bomb	5h rs	dm lib k	3 da dry	3 4 4	N1 45654>	N14 h d
	Gre sd 3 y ds Ri i	F mi	sd whb	to hy 3 days	dy	N14 h 6 h days	N14 h d
_	G d Lei d	Sh m	7d ya 11 h	7 da m od po m	4th diva	Ge alzedh b tdy	NJ da b lob fidadd
	N lemb	2	Sdy If h	da blood p m	ds f 6 bours	Ni 4hdys	Inc ased d y   f   to 4 h d y
	A 15 mb y rd P		4dys If h	s day m d m	da	Cy or db th	Ore bohmulzo h
3	A I bomb		d ys os 1	d blood	đ	G hzed h h da dull ess d'dama hed BS If bas 3 h d	o if 1 agth
	A ust bomb	7 h m	d vs h hes	d	4	Diff sa ddanan hdBS h base da dum nihdBS d pa righ base 3 hda	H vy p hi so mallopact limed to addy in a ghif i 6h d
			days h	Ch b h		Lef h moh 3 d da	Lef hem bra   b
-	B F q		3d 11 b	d ys dry	4	Leihmh ddy neoldauolib b d i 3dd	Lef h to h d day sold 3 h d pl lth k n g d da
	M rts bomi		7 da 11 hes	3 d ys d		hl dd dalles lit base hds	Nigdda paci 1! h hda lmos lea b
-	8 k		d va te ros to	l3d dry		NI d d days, dult dam m h d B S d pa ga base 3 dd mai 4 h d	N d dabdy
	M to bem		d I I bes			hi dy,diles d dim aish dBS li base Jdd mil8th d	Op   i base 3 d da lea d 8 h da
	F		ad ya 11 hes but pe b- dom			Ge I sed h da consol da rugh b se th da ctolva sol d so I f base ta h da	Li! I midzo paci es h > i f 4 h day opa l y l i b w 4 h d
	Cross hing	•	days pr b 1			Cy nows, sea red reps to hi es d nd d ys d ii ess d dim hed BS lei base h	I ased d 11 to to 9th d y 1 th d

furteend s ft ound g Th o c fig s re h nd gren d's mort r bombs l d'm al bombs or fly ng bomb 'V e tha half I the patt nts we e unconsc us fo ary ng p ds ft per tion II er non c mpl ed f h ad che r sho digns f ent linervous syst mi my Dy p ea as a symptom wa m nifested by II f thm I am s ftn typ th trost nal or mu cula olung the te cost lim cles th mu cles f the ppe abdomen or tho e f the back All b t a pat ents uffer d f om a f thy c gh Hmptys ocu dnthr frth of the caes and h dan in ers el ti nship f thi symptom t thun dince fma ehm rhg as sho nhy a) G ne alized rhonchi wer usually hea d it the pury b t dullness dem mish d b ath o d nd d crea ed fr m tu dep nd d n th d gre of lun hemorrhage Two pat ent we f nd to h v a hemoth a Roentgenog ms f the I gs w n gath in o pate t m d hortly after 1 m When p it se o ntg ogr m m obt in d the as nothing r ntg n I g call p inc The lons verethr nit 1 latral Op ct s e e found the moddl or lo o es nd er cent lly placed Ther wa n c r I tion b tween the eats of the symptom a dithe mont fplm nary damage as reald by the
ray Th teatm tf bl stinn ry fithel g
wa sympt mate Th us of suifo amid p

P J MIN G P S vs M D

Pil hur; N. R. d. Wars 2 J. D. Th. Df. f. ntl tin of B. nchiog ni. C. cinom. nd. Pulm n. ry Tuh. culo 1 N. E. gl. dJ M. 945. 3 76

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Because of the may lead a dring n log cal milanties of ho his cace mand pul mo any tubre loss the difficults. Telprent it a dag out of difficults. Telprent not not not be cass for nother cace maw hoed mitted ta tuh culssh ptalaepese to both auth

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A rlyd gn fb h n c m a be m d o ly if th d se is s p t d d sd d the dfi e ral diagn is The po blty f cance m t be gi p i d t fth p t n t is a m b twe forty d ty v ars l

g In all cases in which the race symptom needs that we want main in the cheet is utilities made into made in 1 Ho to he so of physical 1 wany came and it is a first that deform pulm many the real is and all wangements of spit un are regard by the law in preton of the first that deform pulm many the real he lay in preton of the real that it is the pattern of the real that my determined with the law in the many of the many in the law in the many in the many in the law in the many in the law in the many in t

In the authors s ies all th p tie ts eeme dall w e betwe f ty d st ty-eight v ars f at the tim f th iradm s nt th sa ton m f g of the 2 cas the d sea e wa 1 the right chaltr All the pat thdap oduct h b t n ith r the cha ct f th c gh t th goes app ranc of the sput m sdst m h able from that fund in my other bin nary deers Dull so of om digred it to b aths nds veen tdn ery s Rales it ap cal we dt ted in 8 ca 1 half of th th adm o x ray film It mp rt at t mm b the a gate o t g m dos dh tly rule out th 1 coleac m li symptoms es g ti dp te t g t e r nige gram holl ot dieroei miurih Tob fyl fmath stc td p test adpoint b che py m the perform lealy in the crofthed as MD

Holl g P H Hara II J nd Hirsch E F B n h g nie Ca in m An A by 1 t 175 Pro d Ca s A Ot I Rh 1 945 54 5

Then the spress to compehne et dy 17 cafp den men fithe behig nerally region of the the spread of th

q cy ca omam gmles
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f ct It crsm fq tlly them lad
th t m tm hghas 9 t

P thol g call p t cally li cacn m f th

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th h l m

The there are the the ten lly so defined that patients fit a black the ctd of the ten from the

in orla if ie co the sympton in the 105 c gh c ld suspect d t berculos th cic eum na finza and knes

lhy cal g ar us ally beent i th t ly stages Rx tgen I g cally the extreme var t n 1 th fnd g No s ngle find g or group of fi d gs can be con d ed path g om n c but ray sam ation m st be cons de el to be the m t accu t of th p ocedur s hehlad to a j esump nedagnos of the dese

Bronch copy shuld b done nall pat nts with obscu e pulm ary path logy in the h p of r m igt of bopsy This p cedu his hen suc cessful n ppr 1mat ly 80 per cent of the ca e

In the sires of cases reported sq am scell car noma was the p edominating type a d com pr doin cent fall the care nomas small ro nd cell car oma 1 17 pe cent anapl tic n 13 p ce t and ad n care oma in 6p ent

The teatment is primarly in geal although th method of treatment ar somet me used s ch a su gical diathe my and the dr ct mpl n tat n of ad n se ds or ad m into th tumo These m thods are not suggested as f alue in case JOHN F DELPH VI D con il d perable

## HEART AND PERICARDIUM

B tch lo T M nd M n M E Congenit I Glycog i Tum ra f th lies t i h P th 945 39 67

Cong nt 1 t m rs 1 the h t ( habdomy oma ) rempately rae SnnRckl ghase described the first ca e in 862 62 with tic ca es have been c dd The card ac t mors were een ch fly in fa to nd the ne b n with ea pe c nt f the pat ents dy ng n the first y at flf nd 86

per cent bef re th r ch d p b ty Glycog n tum rs of th h t rely cau cl nucal sympt ms e cept n those p tents in h m th tum rs are sit t d n th ale i afi ts th e t f thi l cat n mu mu may beh rd Ci nos w a f eq ent symptom in the cases r en d peci lly in the newb n inf nts and n those patie to who d ds ddenly Since t b s sclerosi was assoc td theog tlndlar card c t m rs in 5 p r cent f the case o e would exp ct ) mpt ms f a n u ol g cal n t re uch sympt ms occur d In hidr n nd nfa ts th m ntal d I pm twa et rded a d the blty to Il nd talk dl) d s me f th patents hib ted m rk d ind fl enc t th r s rr undings I s m I the pat nt ep leptiform attacks f qu t n ith most cntatfid gs ccur ce i sudd n d th aft mn lm nts f om which co to as u ally e pect d in n case s th d gnos made bef d th

er ported by th a th rs sth le th n American It rature I th 1 th thrd in th gener 1 m d cal 1 teratu In a cae ( mult pl t mors of th hat mathe -day-old boy glyc g as Im trat d that he tumo ell

The uth is suggest that the tem congenital I lar glycog ic tum is f the h a t should re la congental th b! myoma until mo ino nabo til nat r f the les

J SEPIK NARAT M D

Straus R and M rlis R P mary Tum rof the Heat 4 h P th Chc 945 39 74

Reports firimary tumor f the h a t appear in freq e the in the literat e B ca e f the r l c tance fm , tudents of the subj ct to accept the diagno g en in some of these r po t the e has been a c usiderabl variation in the est m te f the numbe of caes that h ve ccurr d th number varying ith th bias of the a thor Appa ently only 163 cases has been eport d to d te In d idual e per en e var es cons derably as among 30 000 utops no cases ha e b en s n acc d ng to report when soth we kers have a ported a ca e of prima y cardiac tumor among 200 aut p

The ste of the tum r may bun n ctically a y p et f the heart but the tumor is f und les fr ou the on a val cand most commonly in an atr um Appar ntly it may be e ther single o m ltiple It gr ed that m all cas s of turn r of the heart the ne plasm is of mesoblast e ig n nd the efor it h been r po t d as a my om fibroma I poma lymphang endothelioma hem ng oendotheliom

le my m th bd myom thabdomyosare ma l myosarcoma fib osa com o polymo sho c l arcom Acc dng to th lite atur th d se cc t ce as f ou ntly am ng m l s as am ng

fem les The y u ge age g o p is ch fly affected hut ages ha e ra d fr m t n month to eventy nun se es As tule t m r of the heat n t d one d

claucally In pat ats ho ha ch dapt man can cer elsewhe e a d s b qu ntly show d sign of carda irr gula it; m t t tic tum r f the heart has been d gnos d On the the ha d there are many cases f m tastati tumo of th h rt that pres nt no elect oca d graph c o clin cal signs Only 2 cases are eco ded in which p mary tum rof th hea t was diagnos d before d th

Wh ther or not pr m ry tumor f the heat can b diag os dp ior to death will depend a rtainly on ts ab lity to p od c symptoms by nte i ing with the cad ac mech n m i small sl ly g ing t mor fach mber of the hart and in som ca e alge o eman ut of th \ ) po ti \oungle ou n t be physol gically ap nt \ tumor on al e it suff ce thy larg could be expected t pro d ce mu murs but nles suspected w ld ce ta h be or look d in the d fie e tal d agnosis A large tumor of an atrum with a ball a 1 val ct n n either the m tral o the tr cuspid r g and

with m rmurs aff cted by a shift in the position of th h dy ho ld c tanly be menable to clinical di gnosis if k pt in m nd in r gard t ca cer th gas and symptom most lkely t be pr duced sould be him thage prearded flus nidet

pe cardil in l ment trire that could then seem if an an fill atom if the macadum murms who that all aris led and if the time is findle distinct the state of the time is findle distinct to the state of the seem and the state of the seem and the state of the seem and 
Of th 3 es I pim ra tum fth hart re p ted b th thos rentac fm ma a f m c m 1 cases th tm a lent hi the third cae tp deed I classes and myton I to y id te is t m The sudd n tof gn olead ed compensa n out pers n thout r ting h tors fcardacd a nd thu de all anat me taifth deless homo hage p ardal off n s met mes n mol me t of f ula f t n f the onduct n system a l gus I l'ula teno hich ch ng n mot on of the body sell sgnsofmdatnultm th It t n fth appea and of the hape of th h rt nth entgengam h ldc etcnd pmastmritheb tathdfleentaldg n s ith condt nde am nat on

J EF K NRT ND

Watt f D and T on E C S c sful R mo I f a Fo e gn Body w thin th P rs di m S zery 945 17 4 4

uth is eport the case hist re recod adp t per tv course of as il ho was hoptal ed beause of deahling crt attacks of p in in the f ft hold nd I ti h t In Mrh 1343h w wu ded by a l llf gm t which te dithel ft anterior hest tithe le fof th third it rostal sp c 1 st lat al to the st 1 bo de He a app rently une use f t four hours H complised of dull s b t al pai which beam he pand see ewith depbeth go or coughing. These symptems depied pota oully Heast dicharged for the hospital t ntv s x days l te b t th pan recu d teen days fte he had left the h spital Th s p in s ated a the sup clascul regam of the left holde and dat dt the I ft chest nt : I Th att ckd ppea dsp ntaneo I nly to cu three t mes d: no th ext two mo ths

He was again by ptalt di August 1031b cause of h mabil t perform the date b' cause of h mabil t perform the date b' cause of h mabil t perform the date b' cause date of the table of the date of the

d mag The g ner l xaminato wa ese tal

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l top rt h ther some protein padp i tegul to tg ther ith me care \ mail area f tl tss d lpd the rath base het cleared The sold pad the rath and care in the sold pad the rath and care in the sold pade to the sol

B J M G M MD

Ws A W nd Shafer L E Purul nt Prica d l Effu n Teat d with Pricilla Gl I tra pe icardially J Am M t 945 gbj

We se ad Shafer port cas h tory of a fresh ed th ty-on ho was seen in the highlit day aft a lloss if fer coun ho dysp and light hemophysis Phis call v m tong the total drope in the total drope is fleft by peumo a two seeds of the country of the total drope is the seed of the trope in the transfer of the broom to the b

P pt the dm tration of sulfad eth pi to the came pr r s \ ly or The tram cu f adm trt of 500 u ts fpe cill t ?



Chat Char I urse S lidaza P pen. d IP I pe cad l pengola

three hours for thre days did not imp we her con d tion ery much A per card al parace t sis was thind e 70 cc of turb d blood to ged fluid being remo ed and 4 o units f pen cill a were in 3 c c of normal s d um chlo de solution It the ratee h urs the temp ature d pp d to no mal and exc pt for a occasional fi re up con tinue i in the same man er. The ntramuscular ad t ation f p nicilli was conti ed in dec e s ng doses f riou or fi d ys. The pate t as d charged as cured on her th ty fourth h spatal day

It I the op n on of the auth is that this cas rep s nts a purulent p scard al flusion seco dary sulfa l az ne or to p cll n g en a tramuscula ly but d d resp nd dramatically when penic llin was adm nister 1 intrap ricardially

B M MAN GOL MAN M D

## ESOPHAGUS AND MEDIASTINUM

f th Esophagu Id J Brg s E J Cance 5 g 944 6 88

An a lis of 53 cas s of cancer f the esophagu s prented The case we admitted to the T ta Memo ial Ho p tal n B mbay fur ng the period from Mach 194 t Dec mber 942-t enty m nths Thyrpeent & pere tof all malg nancies adm tted to the hosp tal

They ungest p to nt vas therty v arsold in fact thr ero case the geg oup bet n thirts a 1 th rtv m e yea. The males pred minat 1-I 4 men to o women The was al a m ld i il c in c tan c mm nities on thi d of th ttl umb of cases com ng f m one e mmun tv

On had dand forty on of the pat ents h d dy plag as the first 3mpt m 8 had [ 1 a th in tial smptom and hoa seness and g r ld bil t n eth first symptoms n 2 th c Only 55 of th total umbe of ca shad smpt ms of | 5 tha 3 months d rati

North ne fthet talnuml r fca h de oph agosc p ex mast n and po to beop es re btand 83 In 26 case thel ion ws b th b furcation f the tach n 3 cases it w at th bif reat nad in 69 cases to bel th h fur cat D tant m ta ta 1 a t th ule th Imphales ath ptrmd tum ad

those about the left gastric artery being most c m monly much ed All but 2 of the ca es sho red squam us or ep d rmmd ca cinoma there being only 2 cas s of adenoca cin ma

The author ble es in radical resection whenever it is no 5 bl There we e 4 cases in which a resiction and an e ophag g strost my was do e Th ee of the pat nts fed in the postoperati e period and the I tsurvived o months before recurrence was fatal Fou oth rpati mis had ar dical esection and cervi cal es phagest my 3 of these died in the postop tive peri d hif I surv ed the ope ation and ded

t om nthe i ter of amehi disenters

as theraps may be helpful ns me cases as it decreas the ed ma about the tumor alth ugh n some cases it's ems to crease the edem and neces s tates n earlier ga trostomy

FORREST D DOD ILL M D

Tomfin n W J nd Wilson L A J E opha geal Car inom in B iti h We t Indi n and P nam nian Aegroes A Study of the Incid nee Ethological Fact rs nd Pathological Anatomy in 50 Ca es Ar h P th Chi 1945

In r cent reports of esophageal carci oma it has been s grested that this tumor s far more fr ou t n white males especially in those I Jewish ext c t on than n W st Ind an and I anam n ann groes The authors are pre enting the data from complete

t psics i 5 cases fesophageal carcinoma ccur ng in neg oes indian a d mest zo p r on of Br to h W st Ind an and P naman n races Forty ave eemen ad syomen The tumor was located n th upper third of th esophagus n 5 nstances n tle middle thed in 5 nd in the lo er third in 2

Of the 50 person ith esophageal ca c noma 26 hadel ical and a t p ye idence of yph lis and 22 h dn r cogni abl sphils A deer n could not be m d in r g rd to th r ma ing 2 Th a terage me d nee of vph l in th enti utops; population frth past t n ; ars is 8 7 p r cent

In the 50 c s of esophag al care noma studied th p i ophageal ismph nodes were gros is n ddine ery instance

I B it h We t Ind an negroe ca c noma of the s ph gus rapls the d a to the n mber of cas s am ng all the typs i ca cinoma obs rved at atps Ìο LN & MD

# SURGERY OF THE ABDOMEN

#### ABDOMINAL WALL AND PERITONEUM

Viair G B Pelimin ry Repot n th Us of Wh le Skin Grafts a Substitut f r Fa cial Sutures in th Tre tment of II rais Brit J 5 6 945 3 38

The auth ses whole skin g aft fo c ses of hern which fasc was f emerly indicat d fo If the to cut grafts we us d Cut con all the elm nt of the sline c pt the pdr It is ela t c nherently ct and compos d f a 1ch netwo k of c nn ct e tis u fibers Aft tr asplantation acco d g to Uihle a ( 030) these nh tent f ct rs p rs t n the metamorphos of the graft and becau e fthe t mulus in trated ind main tained by the te in und which the graft is sutur d a metapl's into sto t conne t e tissu t les pl c The autho states th t th danger f p dermoid cost f mat n is negligibl when th cut s gr ft ha b en inl id unde t ns n

Th q est on a s 1 the a tho mind as t whether twas re lly eces my t em the pide mi and with that end n i whe n t gated th e f nh le ski mplants nh re f ia othernis wold hav hen d His zperm tal w Lt eals th t ft rs al el baco sginds ha foll cles and ep d ms h d ents h ds ppea ed that the h irs h d b n sur cu d d hy a mas it f e gn b dy eact n nd that the h rs a d th cti eth ewr in tunbeng cap I ted by firm fibro s stroma

The a tho has ed whol k n grafts 1 80 ca i dill rat types of h m with at f ct m es its Howe e insufficenti m ha los dt al t th cu en e ates accurately Jo ze 6 ste MD

#### GASTROINTESTINAL TRACT

Taslo H An Ope ton! Removal f Ca 1 n m f the Es ph g with Pre t rn [Esoph ag g t t my B i J S g 945 3 394

Inth attlea pe t nis uggest d nuhch n exoph geal or gast ocs phageal res et o f a growth i fill d by a pester 1 rs pasternal nast mo b tw en th tump of the esoph gus d the t mah th emaning pat f t S ch ap cdr s of course a form dable u d rt ke g but this sa as deration hich m t be ag not the h pel so and d t es galte n te f r aptent with ag thifth expliguore da Th op at n has be n p t int pract e in 3 ca - th death f m accid ntal pine m th ra f th post d f th hest dath f m mp m afte ight m nth and il gpate t h taking ft food by mouth ad enj ng h lif at h m ghte n m the lit
Pr pe t e pr pa t n consist est n h d
[ m t t fou w L with a high cal nc ff d

d them with a less ob truct on is ab 1 1 Th pe sod u dto remo e ll ptief cam them to de es s hag al stas be egula la ag th n esophag al tub and t g e blo d tran! of qurd E phagose p) s s t lt name thedagn b npe tin ndb ps ltm sil pro id dinc of fixity f the gull t a thin dastin m with bo cho-copy a 1 m at 1 the tr ch r left b onchus h ch ould f course nta dicat op t n 4t th s m t m t ! f eds n opport n ty of dilating the stret r if necess ry to feltate feeding and esoph gal dra age

Sho tly h f re perat n urs of local ch th apy is instituted in hich th I go aft ch feding is f ll d by a dose fs lfathiazol

suspense n n rder t r d c th 1 fection of th g owth Brath g cisc in tt t d and th patent famil red with the yeen mak in p eparat on f the post prtie per d Pelm inary ) nost my in the ces ry fth eb bre a g od response t th se measu b t it may be requir d if the es phag 1 bstru t has n ts f fic ntly dm nish du drt catm t

Cycl p opane and oxyg n admin ter d by a cuff dendot ach al tube the mith defaeith sia d pt d no de t g e th esthist n h mpered cont ol of esp rat on hy m na fpost e p es ur when the chest open nd the phy log cal mech m m for exp d g the l ng cann t fu ct The p t n comm c th the ett g up i a d p t n fus on of bl d f llow d later h pla ma while a at cipt a fal agthe diss et a m ures t & p th pati t w ma take fr m the outset and pub ate a d blood p essu re d p

etak nat filte mm t The pocduef g t b th the pper half or t o third of the phagus will fi t be de crib d Fo th arght th act my chose in rd that th de ect on in the f th aort rchm) the description in the general fith a print rehming posted in regardly index is no The part in the fither figures on a lift fither rail post on a lift fithe his right a m pp t db a as ist t as it who ces a ) t m t d ring the ope at on The ight pf w afca ity pe ed th ough the bed fith s thinb dapntl dhes as ith luga patd at I tles th md tam and the go that he ph gu e posd If th b b a mit t I th md tom and th 1 d ded pluricega dthe )g and the this gild ctd! car bing th tadtagth Ift le rablo Fv th t h chate th post pes a I f t occurs ther այհ ct ent lat 1 pn m thr with bd ng I truct on of th p lm n ry blood f w a d ge caculates fir The pen g hold the!!

becafil utrdbtithess tpo bl rt

tube should b put through it unt l the end f the operation to p event any p sability of val e act n d to allow the anestheti t to keep the l ng fully

expanded While the mediast n l d ssection is poc ed mg inf ctassoon as it has been decided the the or dition ope able an dependent assistant makes t there is t inci ions. The first bout

nches long s made into the pent neal cavets the ogh the medline of the epgastrium and the und i ered the to luntil it req d. The second inc. about 1 inch long s mad transversely in the skin verthes prast 1 looted. Though the pen gethe a tant to held in the skin verthes prast in looted.

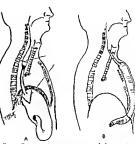
dinth relat elybl dles subcutan os tiss, i front of the sternum by th meth do for peated scesso pr ad g as f as the length of the existers will allow. Thus the deville ent all's accomm d te the upper tump if the soph gu a dift it it pred n ad a ce in this wy m ch time will be say din the liter me e

Men hie within the chest this urgine men pites this mobilize to of the bile lingth if the cophagu by fering the two nd Bilisheat them to fithe erds are separated from the ophageal his to the dashragement per ties.

cavity be g d liberately opened at no ly Abo the loo e cellular t catthe oot of the neck st p e sly fr m th e phagu until th e cod i r a hed Gratgentlenes arequed here t as ddam g to th impo tant descendi ges I hageal b nch s of the infe i r thyr d rt i When the sph gu g it feefr m the ic d to th toma h a special g curved clamp intr d c l nt th pg str c incis on a d pa g b t en the st m ch nd the left l be of th l er is guid d by th rg ns fagers the gh the jert cal op ang which was f th daph gm m de at the e ophage I hiat t ued high to the chest and climp d cros th esophagu abov the g th The first two ingers ith urge left hand n 1d up th es phagu to the creed and rk ther ay f

ad nthe eck bet the ph na and thight cart dish ath null thy pe tat this nit up ster liminh chi all them with fith who that at the much fith na cuill taid nthig might git all the fith groups the dish the dish is delimpform the valumind the sphanismediath by the first clamp. The phaguist had id bet in thing mediath by the first clamp hat mad it the dish did bet in thing the phaguist had id bet in thing the phaguist had id bet in the limp hat mad tely withdrawn the eyer

hch r wand tely withdrawn t the etricar gith top it fitnes phagus this them Thelip t cared the gith dip agm and ut fitnel git receive the prepart of aw the gith to the think the space fBrance thrut 1 nth, pet alturn la fast will gar the temperature of the profit prefit by gith night should be sufficiently the profit the phagus the should be a visible to a visible the and the should be sufficiently the should be sufficiently the should be shou



Fg D grmm the pet the fith pet A Shews the gast oesophag I ese to B she them and fith stm hb ght pwdt the fith ten med a two sdt the tump fith es ph

d aphragm may b pp oximated if n ces ary aft r high the mechasiin m is dusted v th sulfonium de powd r and the th a v is cl ed ith unders ater dra age. D ess gs a e appl d the l g panded by the anesthet st ind thip t t is lowly pliced on his back.

The first st. g. fth p at n ha ingn ben emplet d the g n raic d to n f the p to tat a entreally r ne ed by the s g n and th ans thet st d code whither its possible to proceed at nect the mbil bon of th stome chant the presternal point n If the a esthet its chart in d cates p gr w fall fiblood pr we pe sall the system of me cuy the second stage sho td be pot p n d w it a it d in near the stage that the system of the conditions of the system of the

If it c 1 I set dessit it upper end if the exphages suit do the op nig a nthe prest naltum I the gryth is r moved from the lover exphage in and the night subtured to the him of the past ium. In the nit valide of the condistage the pain in will be I d through the lorse phage to make the properties of 
eltop ce lat ct the anatm the gas tic tent neel ged and the presentals b ta eut mels et nd ld nard to join it. The tmach's n w mobilis d by g til t ct on on the esophagu which I cilt test hd in fith root i the co onarves l bey nd the gind

this regi n as well as the vas h to the splen and the gr t m tum alog the geat r cu e This can be done ithout 1 ibl impa m nt f th blood supply of the f nd of the stom ch f car has be n tak n t vodd ma to the pl me a d rght stropploc es el lt will n be fu d that the stom chica be withdra e trly fr n the bd men and laid n th I out I the chest th the f nd s s hi h as th st rnal angle f Lud ig B mob hzat o f the d od num a Il it can h dawn e en high r th t the pyl ) es iphiste num and th lund s reaches ah e the clycl The dere f mobil this necessary only after a v high resection fith esophagu but nough f the stomach s fre d t allow th fund to rach the uppe nd of the esophamus with ut ten on The growth with the lover esoph agus th card the pprpatofth less r re and the gl nd which hive ben d sected up fr m the claca as n w remo ed and the pn ing in the stom ch is cl d in two lavers. Th f nd is da n up th pest nal tunnel to the c unter in is on f the anastomos s whil th ass tant cl s the ep gastric w und take car to lea plenty of room for the stom ch to pass h nth mu cles without con t ction Th f nd s s trdt the chest wall bo tri chh he than the upp rend of the ophagus which I id on its surfa e nd ut r d in pos ti n 1 small inc sion i now made 1 t th stomach all poos te the end f th e oph gu and an anast m s smade h t een th tw pening the str lin heing cove ed hi d ing the ante n ll f t ma h up o er t The kin or the a a tomo is is closed with dran age f the b utaneo t sue and the ope at n 1 c mpleted by pa n a small na l t b through the ana tomos s it the p ternal pair of th

tomach Whin the ope timi pe formed f growths of th I rp tof the e ph gus or f th cards c nd of the t much the pour through the h d of the se ath left be the diph gm is mais d ade lly f om the soph g al heatus and the g owth dis cted free The efo e the first t ps a e th of Sau rbru b pe ati n whi h Il be the m thod of cho ce f th gro this I mited to the cada o does not at nd high r thin the cinca ity of th ao tic sh The u ge m may w B d f the sel t on of n intra o an extr tho a c nastomos u tl with the p rt in b hand be pos t on t as es the p s t cabil tv f th f me If this is not p s ibl he n d n t ban o th esect on b t ma pro e d to ppl th principl f th pe t n des b d abo th flicient m d ficat nt cn fom to the time of the ort in Thu th es phagu m st be f d b bl nt dis ct n w th th fi gerb tw th de p d f the a ch and th a vgos n fte this r g on ha he n mailt ated pe etn ocam Th di ct of th ıth r of of the n ch is t th I ft f the tr chea a d wh n the es phag al clamp is pas ed d wn fr m th neck t to the chest it m t foll w th am p th

bet een th azygos ein and ao tic ch befo it appli dt th lo re phagus and with living

applied the force phagons and whilam. The blood plot the phages on repeat on what it did do do and patter car on the taken and set right most then a not a down the and the taken and set then a few and the taken and the trunks lite ped state to tradithe men a cross the cot lamps and left returns 1 to be 1 unto obtain a down the set of the men and the trunks and the rate set of the trunks and the set of th

half ay d n the geat curvatur nd as fix the net ura on the le e curv C exhows the ths degree fremo al of its ue so the composite the presternal anatem so if the d d um in thit, d as will as the stemach depart in the app och and posur and the d seet n bill

m hills. das will sthest mach. Apart I mit app och and posur and the discentible the diphragm and pp tha act rich the ecut noithe operating libes the ame have a that described I upper sophageal rectained. Dung the post perating and the pat at a

Dung the post part pe id the part ats ut ed by fl d det though the nail the thrugh which sulfath zole up n no alo d at min tered. When not ue df r th purpoe th then kept open to the atmoph t protect d stentio of the time day the remaining the attention of the time day of the con-

if ght with digr ( wider o dief of the bestian o it sen front the hest and a filt chimut be kept to peet this. The mit of the uter length of the stated by dief this high of the uter length of the stated by dief this high of the uter length of the stated by dief the uter not sou due to in a section of the uter length 
rm yed of the tenth day it all will To u dewtrd arm dewtend arm dwhen his day it all will To u dewtrd arm dwhen his day it all had cesed it be po by the r dual plur if udi a pated at nt als. nd cultured Factin may be inject of the same times to musthr in k of c darv iction from the by num lg Burd Grows MD

Christian n T lot peraty G tris G trose pic Example ti n (L b p t p t Gast ti G losk pish U trisch ) 1/ d 5 nd 943 5 496

Postpert gatt spelf mig n tadfirm ir mother im nits i calpeta as will a nits path ig cal d gastive pe a pct G tros pv ets very plum the p tue who he scha actra dby a mut f oper ficial hyp rir phi at plue er i d leatie I soms The Cluncal mpt ms differ my i pect i m peptic ulc r for instance th pain 1 not rele ed by food intake The question of pathog ne sis open to gum nt and diff rent theories are

discu sed

E rope n and Am rican a thors differ in their
pn sconcern gith frequency of the discase. In
Europe it scons der d sh gentremely frequent

her s Ame (can workers (Eusterm n and Ball r M v Cl me) belie e t to b rare The author these to acco t for this d ve gence of op mo by the fact that the E ropea wrt rs base their d agnossi upon gastro copue find gs whe e in Ame ca the d ag

nosis is bas d on cl nical symptom

Te cach t es a er p rt d and d soussed 5 th cas so occurred after gastronaterostomy d 5 after res ct n Th pati nits d velop d clin cal smpt m f gastrin s i m two to thirty vears after the pc t n lin pof the case gastroscopy r v ald tipically ratus whereas n i racs m lb n gast tits as found by gast occ py The ions wer tool d mostly at the toma nd at the anast mos

of the ntest e There may or may not be fee hy
d ehl ic cid The pognos si poir
Mithough som ell neal improvement was achie ed
by comb nat not the Sppy it time t d daily
time language no improvement del the existences

of tomo nat not the specific the daily g tric lavage no improvem tof the gastroscop find; gs uld be beerved after the teatment U cin te timent e med to b ineffict v

WER & A SOTHERS A D

PB a dLe TF Th Use of Omentum to Cls Pri ration of th Stomach 4 & S g 945 5 7

It is common pactice to cover pe forsted ull se thest mach with tabs from tume p cally sent that adjuent gastine list 1 d rat dandf 1 will estat factor look each table seal n F me talt tan plants grafts he heen remme del finhs purpose be to an the trad grounds it may be quest d hith rith p dure frounds graft plantation of me phreeps the fel tan.pl ats d p 1 v d temporar ly fashlood upply to be cretile loth to the dgest cross for the present lies state leads to meet a beginning to be compared to the compared to be cretile loth to the dgest cross for the present lies state la coff them In the case the

afer proced ould be to ce the dects with nlyl ingomentum hich prumably ould fire geater existed to the destination of the transfer of the tran

out one gs with as pt etechnique nil 1 hes ecut in the arter gat ewill The hes were 11b the madel right in the perforations encounter definically because the select dosplet the covern gomentum to it ely etest

ad al be use mill h ls in the n malg st c will h lto rap dly to p esent the poblem posed by the mr slowly healing perfections fipperler C tron thrad was used to stee sand lgas tures All the n m ls we call wed wate and food

(d g pell t ) ad lib tum after op tien

Living m t l ratches o tab we e u d uccess full t cove r l tiv ly l g h les n the st m chs

of does S ch seals appered the highly resistant to digestion and infect in and gave the gistric defects time to heal.

On the other hand free omental transplants s mi

un the other hand free omental transplants s mi harly employed being t mporarily without any blood supply we found to be susceptible to infection and the corrossive action of gast o pure Necosis and pef toon of the graft occurr d n many instances

These experimental results suggest that in clinical urg cal peduces it is moe at in all and safe to use living test that meeting and safe to experio ated gas true ulcers or to reenforce his so anastomo is Jos ur K NAR T M D

Cust r W C Survival aft Gastric Resection in Ca cin m f th Stoma h S fery 1945 7 5

Or af teen wear per od e pl ratory laparot omy for ca cut man of the t mach was pe formed on 463 pat nts Ol the e 41 e e cons dered to have pe bl lesions ad gastic resction as per formed. The f llow up clinic a nbl to cary thr ugh a tudy in 96 ca e hich can be class hed s follons.

Operate ed ths
F talpost pe ats phrast 9 93F
D ths d th y s ( tincl d g 3 395
bo v) 3 3 35
P to ts failing t is e the eyears 34 35 34

Putsfailing the the eyears 34 35 34
D th the to-fi ye trv 1(5
pt is died f th case ad had
d ce f recurr c)
D th th fi to eight; trv 1(

D th th a to eght; trv1(
patt th d f th ca hd had
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Ptr ts h a dwllf ghty rs 8 875

To summ tire there e 4 pair uts ith an establish diagn is of ren ma of the tom chon h mg tir resect as performed. Uter fie e 27 of per ce two ill is mg. In contrast to the contrast to the contrast of the co

JOHN L LINDQUIST M D

E g t G C Th Creation of a Ga tric Po h f t f wt gTotal Gastrect my S g 945 57 The r p t deals with one f the problems foll

glotal green, and by the nab hit of a meale its with n e oph grounostomy to handle a mail fe d ugs without a fe l g of f lines and d soomf it be au of the la ke of phys call space in the junn mice commodat a mod t wed me l. The symptoms of d at es in the case pe as need acrot de t cont cture stenosi or pasm f the coopbagoj juni ana tomosis they were they d by

fer nt and aff eat! ps of jeyunum The patent wasafity even jear-old m nwh had all gepeptic ul r n the less r curvature f the t m ch inv l ng the lo er 13 cm of the esophagus Becau of the ind rat n of the est of th stomach and an ss ciated g str is it was de ded that t 1 lgast ec

t ms wa and cated

The refle tion of the daphragmatic pe stoneum as freed whe e it o rles th exophagus Th anast mos s of the esophagu to th 11 n m was done afte the method f Lab ; tha lo g jej nal l op brought up ante for to the t ans erse colon The great mentum n samp tat d to pr vent drag on the aff et jun liop A Jutt tuh as pas ed d wn the ecophagus nd into the ffer nt loop of I num i r postop ati e feeding. The tube was mo ed n th xth day a d the patie t as on a s ft diet on the ent e th day The p tent com pla ed of fulln s and d tress after eating ba sum x ay film showed the anastomosis t be fu ction n and of norm 1 sze The e mplaint and s) mpt ms of distress c nt n ed a don the twenty eighth postop atmed 3 it was decided t r ope te nd make ap u hout of th fir nt a d lierent to p of junum This as din by er at ng an an tomo s bet eanth t o loops of jejunum n m nn r simil r to th t mployed i the Finney g st oduodenostom) The pati at had an unevent ful co valescence and s x mo th I te was able to cat a full det f thr meal da ly
The a the des bes n ther cas f t talg stree

Thes the des bes n ther cas It talg streetumy fo care m of the tomach in hich the pred re wa carried ut at the same at ge as the etin Jns. L. Lixbours M.D.

Ac ball A The Term ne of Perfort d'Ulers f the brom chind Duod num (Tromit d'Irpfad del tong y dd) kerm d R 945 35

Printo ian le of the st mach o du d n m results in g er led periton t d d ath i the pat tu less op at n i peri med S me authors report ca es i pontan us r co er; th t prat n b t the ep ohably cases of c edulce and t s mp > bl t ill d a c bath by a nll h The fe to ath r le

educe and ts most of the dac hather so will be Three thather be lees emge evop ton buld be primed n e ecy caentle the tless after the ft The time series by the hours but a f dethat pet nean be pefor med

but t a f d that pe t n can be pe fo med s cessfull aft as lo g to le hours

The the moned the gent of ment of the property of the continue 
solut nisg e Fo il by person csalt ed t isg in a strate ou li 30 cc two r three times i d i To pat ents a r poor g era, cood, blood transfosions a given The author doer res rt to aucultat in of the tomach first him tomy unless t s indicated by frequint and reom ting

There has be no gratimp o emention to tending ty noth o dit ninre atters 1 th motility as 68 percent ce digitalities while at prints 11 found to be only about 20 percent.

T mp n d sutu and c mplem ntary g too ente o nast mosis e the conserv tive operat The ad cal ope tion of gastrectoms not only to the p f ati n b t the di eas which ca sed it. The choi e b tween co rt ti e a d ad cal open t nd pend a the tim elapsed since the p rion a d the p te ts general co d to a If the flied a c prosa d fankly p rul nt reseto a c tar deatd Reseton a dificult a ca es f ule high up a the lesser curs to or ul er! in th duode um with linge i flamm try tmr The choice hetwien c ns rvativ a d adie i pen ton m tb made in e chindi dual ca accod g t the creumst ces About 600 2 perce I fth ca es e n b t ated by gastrectomy Amo gt e a thor cases gastr ctomy was performed by the athrinisoca utues 4 adsutr ith complem ntary gast cent ro nastomos ; care There are 4 d that a case per t do to to to r ho rs after perforation in cases perated upon after eight hours and z a cas perat d pon fter th t n hours Death coured in ? cases of ulc f th tom eh a cases of ule of the du d n m 3 ca es of s tur cas of suppl men try gast ont o at moss and in o ca g te toms AUD G M MD

B sg d J D Gs ti R tinf Ce tel Acut P rforat d Lesion f th St m eh s d Dubd um with D flu e Solll g of th P rit esi Ca ity S gery 945 7 498

Cntrytog alop of the following amount of current clasure fact print dieson fab tomber 4 Aurod um. The adecter of pima y mr the facts of pima y mr the facts of pima y mr the facts of pima y mr about the facts of pima y mr about the facts of pima y mr and aff mr and les ous cat adth to to ly sth amm dat m tal ty less on gr t tha that f pt mary elob t that the ore at on is curat r th tha pall The athrble es tht bth proced es ha ead fin tepla e nthem gmnt f cut pe fraton b t th t th immediat it rest of most pt to best s rv d b mple closu e of th pe fo to nd that the high clince I curr e hild the adt nt The ecurring leers g b q nt es t c n be te t d b) eq to thles rk jawh hp m n Ther a.f h we

es ct th th prtn fchoce s deb tl mpe at Th utho pres t these cat s itl illu trative cas s The indications f r ir many res ct n a

Pel ted care no na f tl st sacl itl lel mite I res ctabl lesions

2 leri ately pticule is as ociat d ith rec nt s m It cous gross hemorrhag Peri rate I peptic ule is a ociated with fixe l

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4 Recurr ng pe f rations

s I erfo at on with ins gnificant soil ng 6 I ry early p fo at on occurring in the ery

Probably under no circum tances should r secti n be und taken unless the pat ent is in fair cond t n ir f ably young and the perf ration of a t or

I e hours d'rat on

Acute p foration of a ca cinoma of the stom ch nto the frepert eal cavity is not c mm n but the autho was able to c licct 2 7 cases from the l ter atu e in wh ch the d sgnos s had been est blishe I at op ation postm rtem exam nation in le 7 of the 217 ca es 1 3 it alleged that a corr ct d ag os h d bee made pri r to perat on o postmort m e matton Vio e astonish g was ib f q ent f il reto ecoam eat peration th t perforat nh d occurre! n a carcinomat us crater instead of a be ng penticuleer This would indicate that many of the carcinom a which pe forate are small and rel t ly confi ed les us p esum bly unt bl for res et n The two n st mpo t nt p oblems ing to perf ated care n mas of the st mach a inst recogn to of the ca cinoma by t tin biop; and seco d ope tive man gement in pp o mately 50 per cent of the ca es a loneles exists I caus of all ne d perito itis from ept c s I gordelay dint ry tion of b ca e the t mor n tres ctable The d flicult es Is mple clos e of these peri ratio by utur is appa at It is th autho sopi on that th hazard of g treet my the pre nee of a d ff sels oiled ne it neal cay t h s b en gro sly overest m ted and the haz d f l akage f ma sutu ed perfo at on n ca ci matous ue mu h underestim t !

as cat lath When perforated p pt c ul recent o smulta e us h mor bage the h mor bag cont butes enormo ly t th mot lit a d t appear that s mple cl su e of th pe forat n ad q ate beca too it n t fai t entrl the hm rhg l'ostm tem camat ab th t thes pati nts oft has m it pl lccrs a d that hem rrhag u u llv an es fr m th aperf rat doe Thri g stie es et mo es the t ulce be ng area nd 11 h mor h g is nd cated these ca es

Repeated or recu nt acute pe i tin necomm n b t p t ts n th cat g ro d v i p cry acute ul re h ch peri rate th l til at w anl man fth n ha n ic dathes ander nt lly requires et on Ins has sthe s adeq at indeats n to em ge ev es et nat th im f th econd perf rat n if circumsta ces re

ta rable

M tofth a lose 1st uctions a cated atl terf rat nae due to inslamm tors lema sh l ray lly of do in ost in tances f ll win i t in af cae the bet uch ni fred or at. man nl as the result f carr g In thes ca e aby ass mu th [ 1 la ll rt purpo e gastroen tero t my a poor te nd choic to esect on From th e i lene a ailabl thel terature imple closure f rf ated j j nal stoma ulcers ca rie a higher m t lity th a the subtotal ga tr ctomy or d s conn ction of the gast center stoms

The may nity of pat ats under th ty f e years of age who suffer from acute perf at on do not re main fr e of ulcer symptoms f llos ng simple cl u and n many instances have recurrent ulceration necessitating su g cal ntervention. In the h nd of stilled urg as r ect on in these patients ill to than simple cl sur and the pe certag fine ma ent

fl be m ch h gher

From avail bl stati tical data it appe is that subt tal g stre esect on can be performed in th p esence of diffuse so h g of th p iton al c ity with nt elve h urs after the perfor ti n of ule at gle to sof the upper a stro at stmal tract a goo! n k cases with a lo r mo tal ty th n that obta ne l by simple closur with out es. The incidence of t ou re I ulcersti nf llo gsimple cl sure is much high than that f llo g resect n

I HY L L VDOURS M D

F A ad Saughan II II The Treatm nt f Carcinoma of the Colon t S g 945

I se ses of 173 pat ents with c re noma f the clawh we exteat d by on ration is en tibe the uth rs Of thes patients to a per cent presented le on

b ; nd th reach fresection fo h ch only ; Ilia t e per ti na could b ca sed o t R e tion f the p m r. les a vas undertaken in 83 9 ptc t of the ; to ts Of th latter to p c nt had oth gro m tastases n thei vero perit n um th t re b wond u gical r m al The ef e the resect n

thsgr pacepllat en nature In 12 pat ents (6,7 percent) es et quasu der t & n with ut ev denc of g os carcinomat u p db youd the lymph nodes in these cur in ght leh p dfor Deatho curd n nly s patient in th t in which the e was a chance I operative cure cc rd fr m ad anced d a follo ge at e att mpts to rem wid D allesi ns The uthors bel we th t su g cal method m t !

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resected in one tage by the expe enc d p rat i th br lha t results If th less n fi ed nfect d or stensie a dr q ires wid ds e ti ni th em v at of the me-ocolon and the abdom nal will the sal e of the two st g peration emil (1 if a astomos s of mall to I rg. bowel as made at the ame tim as the ten es ct on the fate I the I not on I the a sat m sas i d p nd nt upon the amendment of the mastom plut has e t dtr mtcpe tent I intracted upon the extrement is necessary to be the matter of the master 
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and they nie dit use it in the fut fo this p

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JOS HK NASTMD

Fihr HC nd Bur b J C The T tm t! A ute Append tis S th M J 945 35 1

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t is we printited t fbd to d Afte the fourth d y the patient we sambul try \ res lt fthe form of post peratic e ther py thir wer

TABLE 1 -COMPARATIVE MORTALITY-ACUTE APPENDICITIS

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TABLE II -APPENDICITIS-BROOKE GENERAL HOSPITAL-PATHOLOGICAL DISTRIBUTION

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ith th absce s w tho t pll Ho eve ppe dectomy wa suall perf m d aft r c mplet rec very fr m | r t n tis

BE JAMIN G P S DE M D

### LIVER GALL BLADDER PANCREAS AND SPLEEN

B 3d n E A and L yn J A The G ll Bl dde n Pati nts with P nicl us Anemi A Study IN avi wall tion and th Rat of Emptying 1 1 2y 945 4

In a prel minary study the authors observed that th g li bladd ra s n t vis lized in 4 per cent of m le patie ts ith p nici s anem a as against 22 pe cent anticipated in normal male patients. In

s of 48 pat ts with pern clous an mia the gall bladder c ldn tb vi ual ed tn4 percent nam ly in 8 of 23 male (35 per cent) nd in 12 of 25 females (48 p cent) The p cted mc dence of fa I e of va ualizat on fr the age g oup was 26 e t

The auth rs amin d th pr toc ls of o5 cases of pencos nemia am g 3131 c ns cuti aut psies nd found that 3 p cent f the pat ents had h 1 ther ch lecyst t o ch lehth s or that th gall bl dde had been r moved

The rate f emptying of the gall bl dd r in the gr up that c ld be visual ed evealed a ex d ffer c In the male pat atts the curs of e acuation sn tsgn fica tly d fferent from that of the con

t of H ever in the fem le gro p th e h ghly s gmfcant r t rd t on the gall bl dders hav ing d schag da a age foly 69 per cent f

th cat tsinth fretfrtym utesafterasta d dmalasagant84 pc cnti a cotol res The authors signest that no sine cales permit a mamay cau p machin riw got the childo hodu din i juncti.

La OL w MD

Fnn y J M T Jr nd J hns n M L Primary Carcanom of the G Il Bladd A S &

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mo al of t nes

The authors concid that d gnos a difficult nd ter time t art is of ale B ause of the g t freq en voi times p c d car n ma i the g libi dider (n i om 25 to 80 per cent i the ca.es) th auth is g that the gift libider so note g stones h nth d g i first mad b r m d g Euro L m MD

Curr J F Complet Rupry e f sh P cr B t J S g 945 3 386

The uthorgo esadetal deaer potoff cbl compr on of the ppe hd m n f ı ral e nds Th p tent wa ble to wall to the ho pu tal whit upper abdom al pa nd ng d ty e e ob era d in an xpl tors lapa ot my x hou after 1 ry At ope at nth as a trm du amo nt ff sh blood th pe t neum There was as neht rath tras is me cl theev bl ed g of a branch of the nddle ole t 1 The p nereas was complet ly plt t t p t teally almost exactly the ghother enter with a g p ff lly he Bcs fth dspatn twa mpos blt cars t nd to e dun The for e cral deep matters utu eswe nedt los the raw urfaces. The ny had cut the ple cen which as I g t d l I g g u erted and the and was closed. A pane at c fit lad loped but t closel fit.

Jos # G ST # M D

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Afte b coming famil a with the mila test it uthor t eated 29 cares of piner at c dim c erv t ely with ut de th

EARLO L OL & MD

#### MISCELLANEOUS

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Of the compleat as I in gh at a tel tas I rwth pa m ts f d unsta ces h as br chora m m b t

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pulm na y c mil cat n or that pinal nc thesia will p event p lm nary complicati ns

There was n m tality in the 761 ca s The p event of p im nary compleate poss ble by attent to may d tail a high infl ene nd pre l pose t its occu re ce In on third of the c se th was a history of respirat y inf c t n tooth inf ction ranusits imm dat la par to or at th tim for tion The ! tin f i lect on in the n e m with o resp atory t cta d a lapse of fom so on to fou tend 3sblr of ra tion is desirable. In cute ph. e of . chr. ic i l monary infection n th presc ce f br chi ct sho ld be allow d to s b ide c mplet ly The full monary bro chalsy tem beloe du g and alt the ope at on sh uld b kept clear For these! r abdominal cases the patient was a ked t cl his bronchip for to operat on and aslight I and I ab g posit n was used d ing the operation. The p t nts n re usually entilated at the e d f th operation with carb di x de and the imp stan

figlirenthing glo ja trating ni t glaniv c tincugig Win ir chalser in a l ulype ntaniti t it a ligdicuty peeto ata, cabon d ud a dovign entlat n as gen twice

da Iy Th | 3chol g cal inh b t of co gling cannot be veremph uzed C ughing ca es a p in in the ound a d the pati nt thinks of tearing the r | air w th the d elopment of an ther h rma vh ch is a re I tangibl experi nce wher as he probably has ne e h ard of julmonary complication In the great n jor ty of cas s the seasily vercome by upl att n before perat n repeat d during the perat n by the anesthet t and by fr quenty it reassu ance and personal contact postoper to ly Not the lat of this re sourance aid ng the patient in c ghing by h lding his wound whil h cough and at t mes g ving le harn slaps on the back To re force the psych therapy and actually stimu lat deep brathing ca bon diox d and oxygen h lat on hav been used fe in ntly fo a f w days

n at on hav been used to ju nut to a lw days Sulf day a and sod um beatbonat are used r tinely w th fulmona y complications because of the f q ent impo sib lift of different ting infection fr m t lectas early n th proc ss and becau e at lectass fr quently found to be a somated ith

Cath ter a pirat on r b onchoscopy is advocat d
if c nservat e measures fail

S PRE A ZITH N M D

## GYNECOLOGY

#### UTERUS

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## ADNEXAL AND PERIUTERINE CONDITIONS

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ristad ma f the left ovary weighing ry round Perlm tte bserved this sam syndrom n sh chath c m of the r ght ary s lat fo nd st peration kelem n recently repo ted case due i a R e ner t m r f the ovary I add to th been f d that ben g tumors

f the plic o gans the than those of o ar a right ca gieris t the sid ome of abd mil

se tes as oc at d 1th pleural effusion th rs report a c e of p domuc multilocular 3 tad m of th o a 3 ass ci ted with high reat n m and right highroth common with II f the cases ment o d he e n a d

rg dlss of thog of the cll lar str ct e f the L ign pelvic t mo c mplete cur ta el this ca e

Ad gno fm ligna t coplasm of the p lvs th metastasis to the r ght pleural e vity was m de da exploratory operation wa pe form df ll g rem v l f the chest fluid

esst as del trd At l pa ot my a large ova with tdiffculty The e as mod ate am u tof yell per t n al fl id and occasional m ci ous mpl nts en ted n th pe to e l urfa s One pent n al impla t s remov d fo patholog cal

minatio The pot perat e cours was entful

Poth logic lep ! Am Itilocula ps domuc o s ystaden ma of the o ary Pe toneal implantation ftm t u

C mm ! The feq ency of bdom 1 ct by teelf vales these eses A ee t el cal nd path log cal st dy f 83 ca s f v lan fib mas by Dock ty d Masso of the M yo Cl c e

ld 3 cases of M 1gs wndr me I much in fi mm t n p d clet ts and mental dbs n are inf que tl) fo ndi soci t th the fi d nd nasm cha the fi dd ppc rs n mo al f th tum rs must gr with Wigs th t th is cau d ff ct 1 this c nn ct At p esent and

tli th ep m ntalind gspo there ie abim i flud may b ass mel t ch the pleu lea ty by vay of the lymphatics

Ci really the it the sents a nety fymp t m daf tst nd gph cals g She's a ywher b tween thirty f a ds ent fi 5he s fag She may or may tha had child e

may appe cutely ch onically o gravely li Com plants ref rable to the chest ar dysp e gradually cre ing eithe at rest o on mod rate e ertion Orthop ea is a promine t ymptom Chest pain is e although a beaviness in the chest may b

f lt 1bd minal complaints are usually those of enl rgement. There may be reperatory embar rassme t

The prognos s 1 Meigs 3 ndrome is e cellent i the varian tumor is rem ed The importance of this yndrome I si the f ct that it i a ben gn d high is ea ly a d permanently cured by I parotomy and removal of the off nd ng tumor The syndome is fatal only the misdag osed which places the respo s bility of the outcome dr ctly on the shoulders of the med cal profess o DA TELG M TON M D

#### MISCELLANEOUS

Marwil T B Fu tional Am n rrites in Wa
U S V M B II 194 44 569

The author analy es 100 cases of fu ct onal amen orrh a beb occurr d t a aval traini g stat n among 500 Wa es Th e p tients wer given thor ugh phys cal exam nat ns and no gro s ab or mal ties vere found Beca e of this t was d cid d to study varian funct n The method used w re the s gle differe t l st n f Sh a d the vaginal glycogen inde of M ck Th e tests

we re used to ind ate the pr sence in rmal var an

ctiv ty or est ogen c defic cy

The find gs i this series of observatio s d's d that Il f these co W cs w re n good bealth a dwere smptomate cit fo th amenorrhea All had h d ormally occurr g m n es Th e p tie ts ere observed f r i m nth M nses oc cur din 3 foll wing eight ceks of ame orrhea in 33 follo g ten se ks of menorrhea n 3 follow gele n " Ls a d: the emant g 7 no mens s occurr d 1 the f ur month pe od of bservat on

Wh n the tests for o ar n function were m de 8; per ent f th e p tients eth b t d e ide ce of o a n hypof et n Th et logy of f net nal m orrhea is d scussed

and it gg ted that psy hic infl enc sa e moor t nti th ca sat on fth s cond t on The therapy used n the gro p i pati ats was

p yeh therapy and I go of des coat d thyro d daily for month HARRY F ELDS M D

II rn P nd Cowpe II H Sodi m P nicillin in th T truent of Pre um bly Sulfon mid Resi t nt Fem I Gon rrhe II t J S g 945 53

Sod m pen cillin h s b en ad ocat d for use in ulfonam d res st nt gon rhea in f male Excel I nt results ha e b en r ported with this f rm of tr tm t In of th w nables off en ng th co rse ign rhea and th va abl extent of th path logical p oc ss the authors f lt th t diff r t concl n sh uld be e pect d

## GYNECOLOGY

#### UTERUS

II ltb rg S R c nc in Ir di ttd C i ma ftl Ut in Ce i (5t d ? R d b b t hlt m C c m ll t ) i i d i

St ckh 944 5 59

In d t j dg th umhr l bsolt cu s it i elat th R i I g cal Cln c in Lu d o ly ti mat salf hht atm nt sin hed by the lfogreull be n ludd in the tudy Th materile nit 1 fas c sa lofthes 44 (3 4 per c nt) s er cu cl

H v r v th g rd to th or bl m f c rrence mo recent mater I c ull be ut 1 1 sinc m t e rr c tak plac ithinth frt3 rfll trmi t n ftl tr tment There t mat mal c tituted gruj of 535 pat nistr t 1 p to th end Ith var 939 1 mary h lngh loccurel n 28t and fthe 28 pt ts g late d lp la r cu rene a total r t f 32 p r ce t T enty fie prentofth receine erlel that's they
e nf It thept ray or fn's flithept recorfns hfiltetl The auth thnat g a tempt I to I termine h th thes reur cs cull b fr tall I b hist ret mi r rem al f th in 1 1a after th e at on of the ir r datio t catm t W th th ad ic a I en urgmnt flrfes r 1 1 W stma t th tn ! tr ftheg nelge! line at Lund h tt ipt d th m th ! f relim na ; rad at on b the St ckh lm meth I nd f ll clat by hys treto naf klatr I fes or W tm n lad I ntl guil gpine; tht ly tot le tirp t nofth trus should b do e the We th n one ation bing reserved fith cases a hich operabl rt auterne m t sta es ar d e er d t p ration

Thrf d 1 g the per d fr m 935 to 930 petdup by thus incl i 5 1 men mlidm thd T the emght L dded p tent lo had underg e s dat teatm nt n 1932 but had o retu ed fo hyster etom) It operati n gland m t ta along the e ree of the g cat c i unc d a met ne a d filtrat f can I the p ametr It u o on devasf diz es Ofth 8pt ts per ted up nly th W ti mm th d 3 d eloped i tul a rect on litl f the dam t fa lead penel hehe s dh n truble an th a e g al fst l heh heald p t n u l afte mnth adth thd ct galftul ft th est bl hm nt fa hhhalday pete t al s Thre n tance of fit l h t cen the bl dd nd ag na am g th c

not s bic t It the W th m prtin sfund of the 16 ogan Notace f c

xtip ted 5th e hat app a dt bevt l en ell tllt t (n4 fth c th

red I cance was used a the crystie afth th cancer c lls ere f u d pa mt gland) and the emanag 2 pcmn thee fu i what appea ed to b a vital targ ma damaged by rad ton On pt nt wh as o erated upon il thee wek aft esat n fth radati t atme t a complet ly cu d ble anothe wh w t p at d upo at l months afte a adat on hbt dell's ggest a cancer fth c

Of the 6 pate t 1 (75 | rc t) estlife f sampt ms f om the t ght yeas fte the op rat n Of thop tent whom cac culd n the d mo t t d t per to 8 whom ca c ons 1.8 al earlf of smpt m f mf t ht; n aft r hy t ect my th nnth i elpd ca cm m of the ulath ndoehlfy rs ft p tn Th tm le to agulated a dahal yea later gl l lar m tasta pp ar d in th in gu al gon a d pr gr d d p te t ler d treatm nt d thoccur da half y rltr Ofth s m in ng 3 fth a patents till fre of ympt m

fre of amptoms fr th es maft rth pe at n but then de elor d met t is i th trans e cl hheuldbetrptd The pat to still h ad fee f smpt ms f months aft the l ts g al t rie en

Of the 5 m ho emed to have tall es dua f cancer in the sturp ted c ryl. ded at pe half yea 1 t the third de 1 ped s h & m tast i nth smallplis nddedf muca I fore t og ars had el p ed the fo rth st ll h e fre of s mptom f ev rs ft th pe att n and th ffth h at op at hib ted v tales c

pa am traigl d lth ugh o ne w fund th craz till g fie and h l after the turp t n and fre f sympt m h If se

The pati t he rve contand wh se m d to be d ntal z d cane re ll dam g d b rad to n r still ng nd free is mpt m and o chall v is th ee a d n half and f r pect ely f llo ng the e t roat I their ten O th bas of th ralts f his n est t " ad ad at the indications ; the it o this bict the the ble es that the meth s thy oftel ndr mm d tht nord t g abtt 1 t of the r sults 1 ally v mg r omen th fo mol p to b p test JOHN W BRE VAN MD on a trg se le

## ADNEXAL AND PERIUTERINE CONDITIONS

Millett J and Sh Il J M ig Synd om I Ca of Multifocul Ps ud m cin u C) ta d n ma of tl O ary 4m J 3/ 3 945 09 3 7

ea g ti t h be-Ithlti v rs giet the ctofth mofibmm of the ovary with hid op ritoneum and hidroth ra e peciall since the classical epo ts defining this c nd ton e e fi t published by Meigs a d Cas in 937 and by Meigs in 1939

Reports c nce m g th ass c at on of be gn a tumors othe than fib omas with ascites and had thorax are also b g nning to app ar A gt re ported a case of gran losa cell tumor of the ovary ass cat d th hemoper ton um and h moth a T tad Machetti analy i gagoup of 61 tu mors of the granulosa cell type stated that in e

of th ir case hid oth axias ap ominent imptom a d that bd minal fl id as found upon op rat Mel ee report d a ca e m whi h a m Itilocular east denoma of the left overy eighing 17 pour ds as a.s c ated with abdom nal asc tes nd byd o Pe imutter obs r. d th s s me syndrom in

which a thecoma of the 1ght o ary was fate found kelemen recently rep ted case due t operat t a Br aBr rtumor fth o ary I add tion it has b n fo d that b gn tumors

of the pel ne o ga s other tha tho e of ova a orig can gi e i e to the androme of abdomi l'ascite associ ted with ple l'eff s o

The a thors report a case of peudomue multicul eystadenoma f the o ary a soci ted with hid ope itoneum a dight hide tho a d commo with ll of the cales mint ed her regardless f the o ig or f th c liular st ct e of th L gnplie tume cmplet tan in thi eas

Ad gno i f mal gnant neoplasm of the p lvi ith metasta s to th ght pl ural ca ty was m de a da explorat ry pe tion perfo m d f !l

gr mo al of the chest flu d

At 1 p r tomy a l ge ov ian eyst d t red witho td ffe lty There v mode team u tof pe ito e I flu d and occa tonal m ci ous mpla tower not do thep rt els rfa c One pe ito cal impla t as rem ved for p thoi g cal mi t n The post perati e co ise as u e entf 1

Polh l g c l p t Am lt l cular pse domu c)st d oma f the ovary Pe ito al impla tation

ft m tissu

C mm ! The fr qu cy f bdomin f sc tes by its II varies in these cases. Ar e t cl. cal. nd. pathol g cal study of 83 cases of v in 6b mas by Do ke ty nd Mas n of th M yo Cl

aled 3 cas s f M gs synd me I asmuch

flammat n ped cl twits ndom tal dhes ns r infequatly fou din as cit na th the fil d and much as the fluid di app ars mo al f the tum rs m t gre ith it gs th t th cau nd ff t m th con cct it t t u tll ther expe m tal fi di gs pro th re ise

abd mn i fi d may be as um d t pleur l ca ty by w ) I the I mph t cs Cl scalls the jat ent pes nt as ty f smpt ms a d f tsta d gih cal g 5be s

juh ebet nih tylur nde tyf y rs fag Shem vo ma ot ha e h d ch ld

may appear acutel chr n cally or gravely ill Com plaints ref rable to the che t a e dy pnea gradually i e e i g eithe at rest r n moderate exertion Orthopnea is a prominent symptom Chest pain is are Ithough a hea mess in the chest may be f lt Abd m nal complaints are usually those of enl gement There may be resp ato y embar

The progno s n M gs sy drome is excell nt if the oranian tum 1 emo ed Th impo tance of this undrome les in the fact the tit is a benign dis as heeh is e ily and p rmanently cured by The synd me : fatal o ly hen m sd gnosed hich places the responsibility of the outcome dr ctly on the hould is of the med cal p ofess on DANIEL G MOR ON M D

#### MISCELLANEOUS

Viarwil T B Fu cti n 1 Am norri in W 31 B II 945 44 569

The author analyzs o ca of fu ctio al ame orrh a hich co rred at a na al trai g stat on among 5000 Waves Th pat ents 1 e given thor ugh phys cal exam ations and no g oss abnor mal t s were found B caus of th s it was dec ded to st dy v ria f net o The methods used were

the si gle diff ential stan of Shorr and the vaginal glycogen index of Ma k These tests e used t indicate th presence of ormal ova an

ctivity or estr g nie deficie y

The find gs in this so ies f observati s d cl s dthat all of th se co lla es we eing dh lth a dwere 3mpt mat exe pt fo the ame thea Alt had h d n mally occu ng m nscs These pa tients ere bserved f r four month curr d in 30 following ght eks f ameno rhea in

33 follor g te veeks of ameno hea in 3 f llor g eleve neeks and in the remaining 7 no me ses courred in th f rm nth per od of observat on Wh n the tests for o a in funct o ner made 83

per c nt f the patients e hibit d evidence of o a n hypofu tio The t logy if u ctro lamenorrh a is d scussed

a dit s gge ted th tp schei flue ces reimpor t tinth ca t nof this conditi n

The th apy used the group of pat ents was pych therapy drg of des crated thyroid dily HARRY PIELDS M D

Itom P ad C wpe If If Sodi m P niciliin in th T tment of P s mably Sulf namid Resist at F m f Gon rrhea II ! J S f

Sod m pe cllin ha be adv cated fo us in Monamid res tant g nor h a f males E cel nt es lts ha e been rep rt d th this form of Int es les ha e been rep rt d tratm t In 1 w f the anables infle cing th course fg orha and th arable t t f th path I gical proc s th auth rsf lt that a diff ent on f sho ld b expected

H fli girli l dit rict() pp tlatrigle l f destantfelg h ttlitlit penclinth 13 (2) the t t fif p th 1 g al nrltint d grespo a l(3) the dr at n fth I ase a tm y ff ct th espons t

th d g Sets stud | f nales and 4 nal All cet t 6 had fa led to r spond to tw m r co rses of sulfathus ol sulfad zn Fiehd read necure of a sulf amd Acurs f s lionam l 1 d sc bed as bei g b t een oa d

All pat nts coh pt 1 1 1 1 1 wed 1

carfulls the fount cult i am bat us \ jost test f e s ia ft o r m e c rees f ulf n m de a intrip t d as sulf na m d f st ess. These frug fal re e then iler lea llte f nnellntl raps

Incilla spent cultivatec f trle littlid ate es hes lut cerd gto ch d lesr ng gf m ooot 50 000 Ouf du ts irith hours fo at tal los g ff om e ooo

t oo ooo Oxford unit

Synty fut rses fpnelln wer admns ter dt 71 f mal pati t h e presume l to h lis am I ta t gon hea a d presump tal est pe ell result den 6 pecent It not deh teh fir tefrehosen men has glow rg nit I tact a fection nly was mich than th t of cases hav g sso ated upper ltra t feet n 355 p cent f the l tter g ntltrat feet n 355 p cent f the ltter ca es fal d to esponit pen lln \ 10 the ldr th infect the less the ch nee f cces the

clinth rv The auth is inf r f m thes res lt that early lagnos dearls neut to of pe scall n th ap e pa am at consid t sin th co trol fg rh a I the femal in hom lagn a ante e

a lifeltt etil h it c nu gil u II at 1 t I th th linmi h the joy lit f lug m { H - rI

Sndrs J T F t Infl cl g th M bid ty nd M t lity Rates in Gynec logi S reery Ba d n Analy is f 500 Consecuti Case S th W J 945 38 ) ta Pri t Pat

heb 1 d consctiv reet gy cl operat us up at pratcha be a ly d f m th standpo t f m rb d ty a d c f talt adha benempael the mlees of

roco cas s potd ogs These ole shaca fatalty rat f prent as em; d the sitalty rate of 8 prent a la or t liftly rat of ope

ce that h f mer s It loosh a ded and ce f m pr p st prt e ampleat s the ghth crt a lelet n er tretrnih co d se s s than n th first

Pre p att and p toperat e ca e sba cali

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t e fl dsa l i b le blood nd pl sma adthecle dm fget e tran f of it t ld c mpres o T the se mpr m nts s ell st m ca ef l d mo e e natant obervint detetemple in ther p 1 yea beatt b t d th impr ed re it in the s c ds

The gle death with cod reso rdms at tysix ses fewhold nthe operating table d i tra e ou sod m ne toth l a cath sia which pr m bly a admitted trody Shew udgigd gnot ev tta from trrhgailt mined gn F bl. F 1D

## OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

D2 JF and D ley DE A Critical Survey f 2 Diagn tic Pr gn ncy T sts C d W A J 945 S 37

Although the numb of pegnant v men accepted for duy, in the Royal Canadian As F c s only bettern 5 a d 8 p r 1 coo their elim nations at the time of the intial plays call camination would be dead ab! Because the e pens invole d a runn grout ne Aschhem Zo dek or Frendman tests would be too great for the result obtated the authors thempted to ut late the colostrum test and the hit of the test on a spec men of urne to see en her pt anners. A description of the proc dure involved in the integration of the colost um test and the analysis of the bust dune test is unduded.

The colostrum vas prepa ed acc rding t the method o ignally desc ib d and the i ject ons e made and the results interpreted by one ind dual

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\ chheim Zondek or l-ri dman tests \ ere run on \ \text{W} men sh wing a po itive r action or a ps udop

tiv re ction. Hist dine tests were run on thes me individuals and n ll a pelvic examination was mad.

The results of the clostrum sk n tests on 542 me are ht ted in Tabl 1 The tests at the Won ens C liege Ho pital and at the R 3al Ca dian Air I ree examining center vere cased out by the authors Forty three per cent of nonpregnant v m n gavesuhe a defin tep r gnancy or a weak p egnancy et a hy bits test

The results of the histid ne test ar shown in T ble II Of ro 6 nonpregnant women 124 [ r ent gav a positive pregnancy reaction and in 8 d finit ly pr gnant omen a negative reaction as obtated in 6.

The a thors are of the opi on that n ither f these tests is pecfeenough at least in their had to be ut led indetecting isolated eless of plegnancy

TABLE I-RESULTS OF THE COLOSTRUM TEST

R i 1 m se ts	U fili Cli i Medius		W no C II Hospi i T		3 RCAF (W 1 )	
	\ mi	P ce	A mbe	P	Numbe	P
Pos ( regna cy) re	69	98	1	6	1	
Perd ( kp go cy) ac on	3				3	-
Tot i pos ( gn ) ac	26	99	3	8	4	
\ B			6		1	8
		00		00	7	99
kno bo pregn es Poss (gn.)						
Per d (we kp cy) on			6	3	,	3
T I post ve (pregnancy)			6		3	4
h ga ve ac ions	3	968	-	6		7
		90	6	00	5	90
T   ed   Does not i i d grow i bline home pos		e Na d na	6	1	4	-

#### TABLE II -RI SULTS OF THE HISTIDINE TEST

	k pre	gn ses	k a	1
For or (prema cy) Wesk por doub f 1 T I Jone or NASI	N	P 5	34	P
\rightarrow \right		7 00	*	6 80

am I rge gro ps f s pp edly monpr g nt omen JR n W 1150 MD

Bigby M and Jon's F A P gn ney and Dia bet  $B \ i \ Ji \ J = 945 \ i \ 36$ 

The deq at use of nsuln has dera ed the maternal mrialty rat n th p cod d bits but th fill death rat rm high In 94 La re c a d O U s) h d a maternal mrith, if percent and a fill d thrat of 37 per ent h the noly that completely spure deas a co dered the latt rigue fallisto 23 per at Bif and Peosey (0.41) pea 27 pc cill laided thrat In and Peosey (0.41) pea 27 pc cill laided thrat In the laid of the l

I read d lably to tem said to be the strong tattack and a high edec edd by hmr nw trail rick and Tillmann (338) rop ted to eman ni 3 perce t and Whit and H (343) fund the cude ea high as a perce ti 19 pg a ces La renc ad Oakley (1012) found tem into by percent fith 54

cases

D bt estend t pr d ce sat and postent u m t La cance a GO 1/3 (94) think they reach mat nits at b t th tys n we ks not that f they are not dlered nit they eft it we ksold they a creally posten tur. The legs e (up to stal) nay bed to the xs e abo oppt n f gar rt th ic edp ducton far th mone hy they such that ye a dark et ipos blity is for dit does of mpo jublic to trol this such that had been the they are the such that they are the think that they are the such that they are the that they are the such that the such that they are the such that the such that they are the such that the such that they are the such that the such that they are the such that the such that they are the such that they are the such that the

Premat d the fits seemed of the fits seemed to the

difference parties and the property of the pro

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ca b hydrate intake At first they

us al ns ln arra g m nt As th r ns ln e e m nts ic as d for p ef renc they re gi sofublis l inth morning a d a m ttue e f zin p tamme and l bli ln i the ing l wery diffcult cases it may b ad 1 be t us th d jct of ol bli l b f r lnch

Dum labr the suld twas gealngs psbl dthngloo (rlte) fmst gmattohur ntral and ext 30gm; tho tfths odstg Them sclaetet labor ede the suliquem tsadth

Aft del very f si lis d da rul ad at sfactory wisk garring me t tog e half th us lam at a th foll vigd y and b ld pth

dos if nec sary

I ematu d'i ery at the thurty si the ra enth
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te onea t rma d'b caus of m chan cal difficulties
due to erla ge b b s

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and the pate the first was post could be finded at the first the form the first the fi

the fast cytourn mass as because be a gles (te poof 1) is atter ery thours) attmpt t peen the basis of the tday that add that a dath aft to be tfd rg exp data mile a on poblem of the basis of the tday that mile a one of the basis of the tday that mile a one of the basis of the

K b k A J Fit g raid J E F da V t. 6 R dolph L Ca n ma f tl Cervix d Peg new tm J Ob t 945 49 3 7

Fight case a fea math t pread during pg n y we el welly still did not part p are The ec dt bit fit case is en tid in y art lid rade until bla statusteal lat fith to County II plant lat lid rade until bla statusteal lat fith to the Cown print plant lat lid rade until bla statusteal lat lid rade until bla statust

t sa d om
Th t d y t gad c c n ma of th
n d g p egn cv ss impr babl that to

causes f bleed ng are given stubborn preced nee in d agnos s and therapy The mal gnancy is thus d g nosed more fren toward the end of preg a cy ben the gmwth has ach eved larg pr portions Ca c noma of the cervix contrary to the opin on f several contributors co ti ues to develop at a rapid pace during pregn ncy The earlier the d agnos 3 is establish d the sooner flecti e th rapy may b n titut d and the better is the ultimate prognos s

The teatment of thes case depends up a th d sposit on of the pregnancy. In the first trimester the p eg a cy is dis egarded and deep x ray the apy s 1 st tuted With the death f the fet s radium is dded to the treatment. In advance d pr gna cy there is added to cern fo the c rvix. It hould be spared the inj nes that occu during pa turntion If ther is no infect on as noted by the temp ratur or character of the vaginal dischaige a classical c sa an section is performed to sp re th c rvi and t leave intact the fu dal ports of the ut rus to facilitate the radium therapy this thirapy sista ted aft rute no in olutio has occur d. A t tal of 4 500 mgm hours of radi mi gie in the qu lly d'vided doses As soon afte the d li ers of the baby as p ssible deep x ray t eatme ts are started and co to ed fo a l ng pe od of t me In the present of local nfectio as sudged by the erit a ment on d a P ro cesare sect n s pre ferr d I p gn er selose t vablty th ee ar an may be d fer ed and from 500 to 3000 mgm ho sofradum mybge to the rv t 1 hib t th progress of the ew growth t mp r ly

Th ultimate progno sfrth patie thinge n the proset teo tout n f the dep ray radi m th rapy th t stituted aft r tb di po tion f the p egna ey The patient m st be ad sed of th sen usn s of h t e nd t n d re thy r 1 1 etly E L C YE MD

### LABOR AND ITS COMPLICATIONS

I haston R A AC itical Analy is ITw nty Two Ye is E perl nce with Ce re in Secti in Am J Ob 1 945 49 576

The a thor perf rmed 36 c re n te tio se es of gozst mornartem dhe ses nm dneofópe ce t

Ab fast ry f th m ag ment of cesar scton cass nHut Tasgnwth n 2 lys s of twenty toy rs expe e ce Th 1 c d ce of es e sect nin pri t pact ce limited to obst tres was ! u dtob operce t R this relat cl high rate ar gi n

Mo b dity a d mo t l ty figure bt a d by b tt cans e c mp ed with those bt ned hy well regn d gen ls g ns and by ge ral practit on rs \ tro s o id eth r a esthesi na the anesthet c fch ce b t m te n landf tal mo

tal ty rates f rall types fa eath ties sedare g e The l cervical type fcs an ctimot n mbered all oth r a tes perf med nth e es by 5t 1 l lic dyst c w sthep mary 1 d ca

t on for the procedu in the gr at majority of the 362 ope at ns Matern I and fetal mortal ty rat s ssoc at d with each ind cation are tabulated The su vival rates are tabulated against the birth weight of the infants in the toxemia group and it is con cluded that o e s hardly justified in performing cesarean section in the interest of the child if it weigh less than 3 pound but that there is a definit place for cesa an section in salvaging children from mothers w th toxem a if the f tus weighs from 3 to 4 nounds or mor

The fetal mortal ty is all o tabulated against th p mary and cat one for c sarean section and impor tant c nclusi as are drawn. The gross fetal mor tal ty fo the current series wa f und to b 44 per

ent and the er et drate 1 spercent B jef summaries of the maternal deaths are re co ded The gross maternal mortality rat in this ries was 2 2 per cent while the cor cted rate was о83 р г¢ел**t** EDWAR L CO NET M D

Ull ry J C Delivery f Quadruplets by Cesar an Section J 1m 41 As 945 8 83

The meid ace of qu drupl ts van s in diff rent c untres as d sel sed in the foll wing stati t cal re po ts Guz on in 1880 f und them t occur once i 757 000 births in 180 H ll n of South Germ ny s gg sted the a sly rememb red rat s-t as nee n 80 b rths triplets once in 80 × 80 (6400) births and q drupt is once in 80 X 80 X 80 (51 000) b rtbs and Greul ch in 1930 studied m I coc coc bi the f om 22 countries and found

quadruplet to occur one in 6 o 734 birth The following cas is pot d becau e a sur yof the f terature fa is to re eal any p vo s quadru pl t which were born by cesarean sect on

The patint as a thirty o ye r ld woman who had had a cesarean section t o years bef the adm sion fo abrupt o plac nt e The baby na stillb m Her p stpa tum c ree was t rmv with a t mper ture 1 ated bet e n 101 a 1 6 deg esf i elv d sa

In the pesent pegn now the later instrual teld as Mache 1944 with the appected date perd as Machi fe nfi em nt D cemb r 19 944 D r ng the first f u mo the of the nt part m per od she com plan d of con d able nau e a d vomiti g so much so that in I ne she was ho p tal z d for o e

e k for pe nic o s nausca. She re ponded well and as d charged improved

I Augu t th uterus was found t be larger th n orm I fo the dur to n f pregn cy X rays at the time e eal d the p esent I four let es The pate nt was imm d ately hosp taliz d and rem ined sou tith eew is after deli ery D ing this time he terus enlarg d rap dly until ne th t rmina tion I the p egnancy it was diffcult for he to turn f m side to sd Sh vas gv n a high vitam n d t and p ogest on (5 mgm every oth d v) pl s iro de t vitamins O Octobe 4 he b g n to have som rregular

ute me contract ons a d th uterus became qu t

t ne Becau e of the prius cear netonal the st my con alese no it was bell e el that possibl ruptu e of the uteru might bemment it that ny lab mg the pecupate this condition the notice ces can sect no fird the sfest poed text etc. the China fato al spinal eight schosen be use fit let ty a lahghed sistential to the label.

Act cale r n cton p f md on No mb 1944 nd 11ac ta f undon the te o all o th tit neer pt to through it c ch th fats Th first we d l e cd as b late alf oth g th sec d also double footh g d th through te central very pesentat n Thee er all fem les and wer encl ed un as gle sac Th furth wa s m les and wer encl ed un as gle sac Th furth wa s m les parat pincenta

The w ghts at b th w e 3 poud at o c s 3 pound 9 ounces 3 pound 1 unc nd pound 4 ounce re pect ely The nfa ts b ath d and cried st ntly on remo l from the ut ru and she d gool m selev b

At the end firek the pet eghts very apond is once 4 po dia ee a pu dso ces and 4 pound espect very the digse ited of beat mike from a mike bak trond to the hospitel T? mithren a leen seempletely un til 10 pu very apond to the conservation of the

F E G Fiell dred Con ec ti C r n S tin Operatin Am J Ob 1 945 49 4

The maternal mo tally 1 th first 1 secomprising 1000 car sol ceasar 3 to 40 mas 0.8 per centa 4 d the lat 500 cars 3 per rect tal 6 sop per cet de c se For the tal 0 soo sess 1 was 0.65 p c nt Fur of the death nth first 1000 care s it d from infect nof g tal 1gn \ d atbs th lat 1 group e c attr b t d t puerperals p a att t d by autopsy

The bdty the line is a \$48 per cat The morb dty the lite g pr 3 per cet This as a deer a of 20 pc this both you that cat special state and the special 
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II at A B Ms 1 Ob t tricII m rrh g Req ir Ing ll; t ect m; Am J Ob t 945 49 46

Accumulat g vde e dc tes th to bit in hor h g sar them to mpot it ad p hapf them of goet accurate mimorily Smplad elil. Occurate mimorily Smplad elil. Occurate mimorily Smplad p earlier to the sat my or victory better him the states of the sat my or victory to the same of the same

seen to fo tys yrs that a e ge of the tyfryrs The prty a dim t s da rag d The age ith prets and imt t t te hem hge 1 th 8 The use f th d a es foll rupt d tru t tra t bl ab upt pi ı tı tm hm c ted 1th pla ta ha 1 t 1b myom ch S fth Spat the dec dp at lc the cl I g ral th b m rrh ge f dby the pat the ld th b p lby; at lea 1 Th h rrhsm 3 ( ) p p ly b trmed ddn p ga cv Ho m e gil tad ffcti atla shth td3 fth 411 It d dich hmrhg5t t'd 3 f th 4111

t d; 3 fth pat ts fth rut

The realital leath ram talty of go per c it ill of thes d tl cc relprit dlis is a li 3 cases the f tus k itohaee j dmt st ftlem th toth ho pital Rup ture (th ut s as the cau e f 3 fetal death and abrupt o pl centa accounted for the fourth death in this ser es

Shock as prese tin each f these cas s of se ere hemor hage a d in 5 it as profound. The volume of hemorrhage susta ed by these women was la ge a d ften tr mend us Large volumes of blood bl I subst t tes or both were required to k ep them out f dang ous shock and t carry them

through the hyst ectomy

Cas s such as these challenge the judgme t and skill of the obstet ician a d test his capac ty t act quickly and effectively Instances of uch sever hem hage are rar in g neral obstetric p act c If ever in the small g up f cas s in which such s yere h morrhages d occur r sk of de th f om x angu ato e ce dingly high Laparotoms and rena or removal f th terus is the first bet tr t atment to b ppl df rupt re of the uterus For other typ s of i t ctable bstet chemorrhages l parot my i ma n a la tres rt but it should n t be delayed t lo g

The purpose of the art of a not to urge the f que t'us of hystere tomy ; the t'eatment I ob stetre h morrh ge hut t p int ut its important pl ce 1 the reductio of m term I mortality f om us gu t ng hemorrh ge when it and cated Th perat n is indicated hen the ut rus the site of al sion pro ocat e f tr me dous hemorthage th t unot accessible for h m tas vaginally Hyst c tomy s indicat d all o who the usual method of obstetric hem tas such a proper ute ne tamp)
nad though the vagi a f it One the indicat n has a usen the ope at on sh uld n t he delay I for m ny 1 ta ces such d l y pr v fat l

rton J F A Mo tallty Study of 187 D th fo 66 376 Li e Birth A J Ob 1 945 49 554

O e h ndred and ights even mat nal de ths pe td from a mat m ty hospilh v g thre parall ing services () a clines rvic heb h i in close co-ope at on antepa tum trap tum and postpartum s rv ces und the s per s n f 21 10 ted obstet c n () n ncl 1c rv ce offe g h pt l faclite fo th mergent and oft times fr the n trems type fp ti t a d

(3) a pr ate ser c to hich any the cal phy c n in th co nty may nd h p wat pat nts Fifty fi of these 187 de this ccu ing in 66,376 b eths h d suff ci nt el n cal a p ets to w a t

the be glbeldpe utabl as fras the hosp t ! man g ment f th ca 8 pe 1 ocol eb th

No ttempt wa m d t correct these 55 o to if rent at th n ncinc (m g ncy) or pr te ca fr m th cl c cases f which the hosp t lw s f llvr pons bl v co ct n as m de for po t jartum readms ons frhm dl ics (xept

con e n d

ag ntju sper linfect u) n ra anst ti trosf r f patent fr m ther ho pitals

The thert are a group presented a ry If f cuft probl ma ess ng the prevental ility f n ternal mo tality Wh t good m ght have com f om th p event nof pregnancy in this group the auth r as unable to s . Exper nce in dealing ith it r asonahly far advanced pregnancy satisfactory

The greatest el ment of p e entablity n th n tire group was rupture of th terus hemorrhag p erperal infect n eclamps: and heart disease Ruptu e f the uterus pue peral nfection and hemorrhage can be comb ted only hy increas d clinical vig lance and f rth imp ements in gen

ral nd special techniq e

Some hope f r a furthe reduct on n rhe matic hea td sease and the e lamps a gro ps is antic pat d by earl and log pr d of antepa tumb drst L C ELL M D FD

#### NEWBORN

S of ed fi N nd Shmig lsky f Purul nt Paro tftf in th Newborn J Ped 1 S Lo

P or to this port 57 case of purul nt pa otit s i the n born had been recorded. The authors e port 5 addit onal case ob rv d d ing a p od f hve v ars in t h p tals f llow g th d livery of app or mately 10 000 infa ts du ing that pe od

The ga i m cultured f om the pus in every cas th epo t w s the stapby lococcus ureus hem lyticus which s th predom nat ng organ sm n the nas tharyn of infants from o t three weeks old a d is a p t ntial path ge Th re wer no co stant et ological factors

The as first an unexpl in drise i temperature to 4 F from the fou th to the twelfth day of If commo ly at abo t e week of age With t nty four h urs a swell g I th pa of d gl nd was n ted acc mpa ed by heat a dr dn ss There was also a orevia and s me loss of we ght The blod showed a marked leucocyt s (if m 8 000 t 4 000) the le cocyt aver g g f om 65 to 80 p ce t of th t tal wh te c lis

Witer the treatm nt which a nutlin, I the gland rap dly inc eas d n s e a d becam fl ctu nt n the r fo d ys It then healed rapilly after o cis n nd reco ry occurred in from o e to t we Ls In bout 35 to 50 per c nt of th reported ca es th gl nd b came of ct d during the cours ff mt t three e ks The e were the opposte prtid gland a d rous creical gla ds in all of the th p mary o gam m was usually f und

A soon sth d gnosis w s mad by th presence f the will gov th partd s lfathiazol was g en by muth gr I r pound : twenty four rs I furds s Th was tolerated well th re we no react ons f any k nd 's soo as fluctuat a was ob erred a the gla d a small i c ion was made at the lower h d j st ov th

an le of them dible Apr be was serted and all pus pocket e vacuated An i dol rm g u e drai s ert d to k p th wo d pen for lo ts eith urs and am t rmd ssng wa plac I we the r II al g as p mpt a d the re man do ly a small sc that s mj r pt bleafter le m nths Th sullatha l w s tenued as I g sthe a aydranag or utlth lec ytec nt had f ll n m rkedly

I all i the lir ht tre the pren is wa given shad I rt cul rly fo small bab s The ve age mo tal ty a g c 501 C t 1tb no m rtality 1 th re F 1 A r WD

### MISCELLANEOUS

G rer CD St ility th P tSt eu of le m nt (t t d d tad ct 1 d t d m d ded s t t t met) All

Whi steal to s form by the ght t be all ays det med fet n th f m l tino komn th t m v b d to e ther mal r femal d fi ne s dan qu'il ca f le mi ation m the

m I of both pa to rs The meleciam tonshuld nel de nexamna tion of the semen and the clisic ntaid it It ot suffic nt to ay that th re are ma mot le pe matoz a y mo cth h it ould b suil c tin nex m tin f the blood t as the the e are m ny de ll le nt muth tak f th ital to an I m that f the sp rm t a th pre ce f ny bomal foms ad the cp city f the sm out to el d'int la y g n h l fet nd bip per men f m the estrel h ld b ex mu d fhe bas I m tab I m should I d te m ned in men as Ils mi the bet fo d that f t l ty lo 1 1 l 1 d al 1 th lo t hab en b lm tab! m Thell n t st sho ld be m d

h h c nsist f the m cr s opic amunat a f seme take f om th p sterior cul d s cand docerv form and n half to two h urs afte c tu

In the man carfl e tgen xam nat sh uid be mad f th wh le gen tal t act to d m str te any malf rm to that might nterf te th pnt at on of the mn The tubes may be or cluded or the ut us reto ted The kurze k Miller t st h Id be m de to d t mn hth the endocers cal ec et: 1 pe meabl by th sem n Ad p fth ss cr tion and ad op of ma a e plac d n a m croscope l de at d sta ce i ah tamm fom each other i rm lly th sm

Il mov to a d the endocervical secret nandmir with it Ab pay pemn of the nd metri m sh ldb tamin da dth amo nt of the vn s f mal h rmo es det rm n d The desquam ti n fr m th agina sh uld be e amin da d the aginal

All d terms d The a the po ts th examp ton fasest nie p to ts fr m \ gu t 1943 t J ly 3 1944 t th Sp h Ho pital of W o H fou d that 3 per ce t f the ca es of st ility ere du to bu mul sties f the t bes or per ce t t ab rmal ties the m! 16 pe c t to h rm al fa tors t pe c tt co d tions in th cervi 8 pe ent to tro

of th uteru a d per nt to nus other causes These stat tes ar very im I to

the fact g tors in oth o ntres Th autho ucc ded in b gn bout p na c) n 44 ca.es (10 per ent) b t l) 3 i these cales n s the es it braned by su g ry i zea es t as acc mpl sh d by pl te pe ti th t bes nd in ca by myom et m The des! tr atment for stenlity ; the Ir ts meal a d the pete of gery in the cet a h be mehabs d Theath ugesthe peter for b tabl bed fo th study f ste ihty a dth tf se csb tabl h dirthe dg t clases
Av E G Mo A ND

# GENITOURINARY SURGERY

### ADRENAL KIDNEY AND URETER

Flock R II Th P ntive Tr atm nt of Cal clum Urolithi 1 The Import nt R is 1 Ea ly a d Frequ nt R ntgen graphic E m In tion J U l Balt 945 53 47

Flocks analy ang or cases of calcum ohth is following far the cofth spin of the of the pelvis and a number strictur. It is ur then sites estime porta co of feet ent a dally yet chick up comit toos have round toos ped poing to calcim up of the sare of has ebeen pescent that of conditions ped hos g toot need must no fronditions ped hos g toot need must need to the sare of has a condition of the sare of has a condition of the sare of has a condition of the sare 
mary tr ct i feet n Wh n recumben i nee essary hy; calc un cannot h pr v nt d F these ca es an o ti ne of t eatment's pre ted

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ahd t ds rable
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4 C ntrol of nf eti n

5 C nt nunt on of t catment for thr m the fter mrob l zat on

6 Freq entro tg og phækammat n du ng th ill sa a d for ne sear it immoblikat Will Mill Scitt ND

### B th A E Th B lati n hip (Epitheli 1Budst C rei ma ftle P I l of th kidn y Ur t and Bladde J U i B lt 945 53 45

The study ens ts primarly form e pie saeh fo ell net in th u ters fr m 54 con en t eat psesadin 2 urg cal pem u na ) t cti clud ng 4 p p flars ca n m tnipel: 7 ftheurt ad of th blaid Epthel leelint cfouning 8 fth 54 a top V caes b tinn cae s nin plate hing fond in sociat with u a tratbd nests In the su g tal p time tiss d t mad diacent to the 1 m y ca c n ma st hed. Th sear as d 1 tai pear m lig nt p th log cal but me e pically thy led ubcut n s h) pe em a with ro nd cell filt to n i ome d ze tatin I the conth lal ells int the Ip t g en in th aut pey ti u

Upon the mpt nel atth mp bea lattn hp beta nep that hp beta nep thal abuds a car comer rent so the nyw to din a car fin to cancer nature to a chart not a chart met and chart bads atto public to the new to a chart new that of the car necessary to the car necessary to the car necessary to the new to a chart necessary to the new to did not can necessary to the new to did not can necessary to the new to did not not necessary to the new to did not necessary to the 
I ge oft F M nd M igs J V The Treatment
f Urete inju d du lng Gynecol gic Opera
ti ns M E gl d J M 1945 3 335

Acc dental pury of a u eter 1 the most fr q ent er s completation f gs ecol gir pelo c ope a t n Sev u eteral j ries occur ed in 500 total byst r ctomics and rur t all j ry occur d in ryo s p au ginal byster ctome of ming a fi vear per d at the Massichus its Ge eral H spial Bos t Thes Seases i ved to ill strate the type f

injujes the toccur and the sing cal principles and priced es to be folloged in repiring them

Although each patient must b trated cco di g to the circum ta ces in her case there ar certa n mpo t at pr cipl s that sh uld he obse ed when deals g ith th' problem of the dam g d uret ? Fi st the imm date recognition of the injury is of the tmost mportane This is true speci lly ince proper t estment at the time of operatio may result n a succes ful ana tomos s with hospitalizati n no I ng r than that required for the outine uncom pl cated pr eed r In th 8 cases re ies cd ini ws oted at th t me of ope ation in 4 Thre of th's patie to did will the fou the diveloped a ur rifst la nd a pelvie absc s nd lat r came t n phr ctomy Seco dly every eff t should be mad t preserve to kid y function on the de of th su d r ter ntif the fu eti n f the th ca be d term ned Palpation 1 of an adequat means of determin g enal f netion and the saeri ice fakid ey by ligati no n phr ctomy ithout In I dge I the tatus of the rema 1 g kid ev is ut 1 I ese at n of the kil ey may be accom pli h d by ephro t my skin u et ostomy o t aspla tation of the eter 1 to the b wel or bl dder The th d imp rtant p inciple s that all u ete af an tomo s should be d n over an in d ell g vi or rubb u ete al cathet cathete s rves a a splint d g th h al g of the uret r ad al o acts t d compress the kid ey p lvis pe t g dist nt on at the s te of th anastomosis. The ndwell ng cathet r bas pro d tself to be the mot tl mgle facto n successi l anastomo is It sh uld r m in n place for s e or e ght days aft op atso HARRY W F K M D

### BLADDER, URETHRA AND PENIS

I n D n R E Operations f r Urin ry Contr 1 of N urogenic Bladd s J U l B lt 945 53 565

The neres puly I the bladder c mes chiffs in the surces The sympathet corers or chit bladd r chefiv by way I the pes cal nerves be come f be rapass by way I the sac larves Star late a of the strapath the curve scau scont at n of the trg much c Th praymath the recht the bladd the op the sc I erves a I recht the bladd the op the sc I erves a I

pil) the itrue rousel f the lil lir of the near that would to not have not seen the bladde near Story to he deep lil lil rouse the lil lil rouse that the lil lil rouse the seen lil rou

ter I incu cuita Section oi in sacrain v p duces rela at n I the bladder and poster or ureth xcept hen th pr tate has enl rged and r placed the internal sph neter In uncleas the set in f the nerves may n t i fl ence the dej ur thrabe cause it may h v become a rgud struct e The x ternal or volu tary sphi etc reise its n resupply though the pude n rees Set in of the nerves produces i most cases the tro neontine of the bladd at his uptar just the bladd will Lastly we must ender it jeet the brain and upper spinal e I Thes us all produce non the second s

n nc of th bl dder

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path log cal changes in th rectum a d th 11th
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1 t th retum Roe ggest d con ting the
jarti llis in it entil dder int one totally me n
t it lle del be at ly m d s e al cuts th th
resectoscope th ought he t nalurethralsph cter
Th unac a th n cont olled by the in a tine ce
climp Inselected cases th is ne c ll is but on

I a d ff cult situ tio

Then thoruse the class fe ting nhy McLel ln n The Neu og ne Bl dd r () the n inh bit d n urogen c bl dd r (2) th reflex eu og ne bladder (3) the auton mo neu g se bladd r and (4) the aton eneurog ne hl dd

Then retechild, the beste mp f the use hib ted eu ogene bladder It scou terp rithe er huted bladd r f d m atta praecox Th a th h f und m my cas s 1 utes s m d by phed me Fph d e a stam lant of th

symp theti ner es

Ephed in als act upon the translation of the author believes at may increase the sinh bit that the casses lek In few cases testiment could a the cantuck be cau of it im nerv usness R ecently, the author used much like testing the design of designs but he has seen af case huch dan the point to my model testiment. I have the cases are the case the case the case the case to the case the case to the case the case to the case to the case to the case the case to the case t

The teatm nt of the cm n g types f n rege cilder d p nd on h th th m t it is presentate or of tay It it protat

tactimas beufl

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tlrthal) ting cos it a d thy hiffelth ptn Hsucs f [rest d pend nth ptn tlking w th the [gs] glid ladjueted Wheth lgs glid ted th wreth.

pen d and u n capes I'r fee? Some patts he week to she was d hobblike be seen some pattern to she was dear to

JEVALO MD

Cor If T Dec mpr ssi n f Chronic Prostate
R te tion Cont Hed By Intra esical Pressure
L et Lo d 945 45 366

C t ble es that dempess fth unnan-11 dd f f f hr p t te t aton shuld be e t 1 lled by a ce d f th at ves cal pes ue d ig th peid of d ompes o rathe than b o tin cath ter d compress without pe e f d mgs

II thinks that fo the most part cases as the ded into to groups. In a proper hampton a prodom nantily unary and a group the limit of appetit not we gate a limit of appetit not we gate the local with local research of a profession of a pro

#### GENITAL ORGANS

Cra JJ dR nbloom D The T tm t f Car in m f Prost t Gl nd J U l B lt 945 53 4

In a attempt t al at the lift at m thock it cann at for prefer tater can mast dy a mad f 340 cases of p state can mast dy a mad f 340 cases of p state can t at d the Lo Ang kes C unty G eral Hope f 120 kg lee C iforns from J I 938 to J n n 944 d to to the cases the read of do co tol 43 pt t the post to can m thod f of J g th in the post to can m though the graph of t

It mad mmm b j t mp m t
t admitt d th t the tites are nt based
jon n hust emat 1 nd thathers d ot
1 t e p trecare om by eset a
end th p A rth 1 they a b t
t an b of s h had coug d f

TABLE I -RESULTS OF TREATMENT OF PROSTATIC CARCINOMA

Treatm t	Medi I m (F m d f d gnosus)	Codiio	n m. h	Cod i (Adumberv	ılblase)
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S rec.ld nag (ys os m m l os ectomy) se	5.3	∖ h ~e 1 Unc	60 TH	Be    rse   b re ( cas )	5 24 9
E ge 1 6 ases	5 55	N h B Dead W rs	24.00 24.00 24.00	Re h ( ases)	33,25
Es mg dea	•	N h B De d	60°g	R Wine (8 se)	7 7
Trans re brat resec 1 7 ses	5 1	h h B U rse D d	20 }	B N re hage (36 case)	3,6
Tra re hral see d reger ca.	6 3	N h	នរុក្ខ	Pet \ b \ W rue (4 case )	37,9
S go I cas ion 1 7 ases	6	N h De d B	\$ 3	B N h	66~ 33°
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JEW BE MD

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# MISCELLANEOUS

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nary exc et n of phosphorus calc m and acd a damph 1 l dos ge

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WILLIAM SCIT MD

W rne A A Th M 1 Clim ete le J 1m M 4s 945 7 7 This r port r presents a study of 54 m le 1 at nts

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T sto t one should not be given for the purpose fst mulating pite cv. While it cut sensome pites the sensor is the promise day at its perhap be the foroider men if the sphase of the reaction

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JH ( LO : MD

# SURGERY OF THE BONES JOINTS MUSCLES TENDONS

## CONDITIONS OF THE BONES TOINTS MUSCLES TENDONS ETC

Col W II The Clinical Diagn I T atm nt nd P g osl of Epiphys 1 Di turb ne in Childhood J Am II A 1945 7 3 8

The tlgy of ep phy calle n nt clearly understo d nd it s imp s bl with ou p es t In 1 dg t 1 ly the e d tu bances exc ft on an anatom c b is Th name o te chondros s has be applied the Sta dard Nom nelatur f Di ea to mo t f the conditions n leng growth centers of high the tology is ben at least of h hn nfed pin nastoth re u et ts and our old and me fmlar trms m the trackedfrp rp es fefs ficat nandff g fnot oth re sons

pohises the ugho t the b di ha e f Th c ure a ery egular an i consta t anat m e po-I the rout feation a al constant fo ans just cular leatin Sme a very f sh e ters at is prent the the while others may rema e mrl tely cart lag n us unt I puberty a dit i an nderstand g f these iff rent pe ds f d etopment h ch f rms a bas s for the recogn t on of ns thigealco it a whehm y s per ne

In Lege 1 th s d a e some case c t inly ar by a d ctor a ds me may p esent s ch ne r me raympt m th t hen nlat rlif a defo med hp is found beca e f d I ping disablty no h try faler touble can be obta ed It is th and nees for et beh I gely e pon ibl for th del y in p op e treatment n many ca s nd ot

egl et on the part of the pare its or the physica I ghty fe per cent fall p tients ar males Thy esenay ngasthr yers I ge ndup st the ten lth ghan n tafter the years The first ymitom in typical cale s 1 v rs ar ually Imp hichde I ps thed y geon but abe t ft reestand fritg tt ng up in them n ing E minati ho se early thed as th t th is I m tation of the otal ns espec lly te nally df bd et n The rentgen g m will be th final id ne n ded t insur the da o

Ih first r q em t f therapy i that eight bearing b d c t ed As tis impos be to kep Il child en thith I in bed for th I gth of t me need d t ll healing t tak pl ce om

st be fo d fo the id al Th T g h t t t calprol thasb f ndt b atifact rvintb r gald and weight burng the ghtb hip ca cer t nly be cut t a min m mil the splint well firt d In the more acut cases th brac n tead f be ne f rrul n the h e t nd d toaf t jec patte belo th he th the he a the n m l d b lt pt qual z the l ngth of th two Complet fiato of his timpl trof

evr nd cat dules f pros l at t an p tation

The ge eral t eatm nt should cons st f three measur s neces ary to k ep the child in go dh alth. an Ith us of th thyrodgla d It has be claused that with early recign tion of the condit quate thy od the apy will elmnt the ne es to for protects treatment b t c f thyr d will hu ry th heal ngp oc s nd th a th rs limit de pe e c m k sh m f l th t t d s it is certa thata od n of w ght bear g es ent l b stil the bone a fi m eno gh to as ume to i ll functi a The can be little doubt that a plact cally norm ! b p will result if the habe seen ealy ni p oper prot tion has benu d Those hob ff ti ing nd bro den g i the cap tal ep phy at the first x m at n w ll p bably alway ha es m d t tion f the h p and a disab l ty which alth gà neglgbl r bee tat first will be ome grat as

opm tef dgn ti rthrits; lat rlie Slpping fth pr im limotal p physicecus about twe as it n by a 1 grb a director to 70 per c t f the ca es the ge eral body huld a th t hich f eq ently desc b d as the F hich type f i d v d al. The smaller perc mage of pi

the age increases E with the pparently perfect

Il be tende cy towa dth d el

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tents a eapp re tly phy cally n m l hidre of the tall a d the rap dly grog type E am at n h the tenty meeter me e ter nal r tat o th a definit 1 m t ti f internaritopand bd ctin Whenth t ghisfl do the t at t fend fog mt e te nal rot tion d abdu t n but hyper tens n may be ev n freet than the no mal side In lat reases the will be ome sho ten ng of the ext mit; with ele tio of th tocha ter abo Nelat ns le All I thee s mptoms and the call hed ngs reds t a grad al stpp g nd otat nof the f m ral h 1 dow w d and bak ard the cok The lat r l r tge gram to b lutely esce tal

fm t kes a not to be m de The pogn f n mlrnar no mlhp good o ly if th ca dd go dath e is t ges then d lay in a t t tagp pe tre t

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Tetnati addt at th ue f thy od crepodut med too e to fth d f em ty an I th p ent on f fu th sl pping fte th ba b e mpl hed The th has b c m therapeutically mo nd m cons n ti e n the tre tm nt of thes cars In c e n which app mate d et is obtain d by kel tal trac and the my take e eral webs rin n hich th slpp ng s yet min m ! rly c es eth lighter tr ti n must b m at d at lth phy all cles to t nithehadm th

a ured by operative m ans Multipl d illing she bon graft through d li holes a l rge b ne graft the Smith Petersen nail and vitall um ser ws h ve all been used for this pirpose and each has it ad o cates There is probably not much choice between them but it should never be forgotten that the oper ation of whatever type is only a me ns to an ind and that end is uni n f the epiphys s to the neck Until this h s taken place recurrent al ppi g may happen at any time

If reduction cann t be obtained by traction ne must decide to manipulate the hip perfo m a radical operation immediately or wait until fus on of the ep physis has occu red n the deformed posit n nd then resort to some type of esteotomy The autho has seen some excellent results from m a pul tion but many more poor nes vith st finess amount ng almost to ankylos s and not infrequently asept e necros of the head The sam 1 true of open red c tion f the head and of wedge st otomy I the neck and he i the efor inclined to postpon rad cal treatme t n these cases null a tr eh nt ic osteot omy c n be perf rmed. In the meantime p ogres in fth les on mu t be t pped by recumb ne

ith r without traction or by th u e of n ff cient ing eal per spl nt Th osteotomy will tlatp tally e reet the deform ty and all oh sat the

lang roff the interest art cula pathological ching.
Disturb ce of the epiphyses of b than at the hp which e me u d th clas ification forteochondros are of r l tiv un mportane one th diagnos has been made h t g eat ea e sh uld always be taken t rul o t moe seve e e dit n

Vert heal ep phys tis do s not occ until p ber ty a the epiphys lpl tes of the ert bral b des develop at that t me Most cases are s en h v betwee lourteen a d e ent ny is fag and the smaller gro pi g ls ome h t li Th lack of acute symptoms and the rounded curve eth d t guish ng differe ees fr m tuberculosis i the pin The roe tgen gram makes the d gnosis lear W th

tratm t the rou ding of the spine my ne a e but in the nd this deform ty s the only ampt m and as the spinal epiph) se may of nit t th bod s ntil ea ly in the t enties there can b pogres on up to this time If se nandr cogn d riv p rt of the d formity at least can be peeted and the sympt me all ted by recumbency plast of I t orbace uppo t ndactn mu cul ex c te d ng t strength n and stra ght n the b ck

Osteoch dros of th tube osity of the tit (Osgood Schl tter d a.e) is a fally mm n c It ns nu Il nact ve dole cent b h ch f et nately lads t n pe m n t lat lt Teat ment a ms t r l th symptom best ni lesse g f the pull n the p t llar t nd n the may al be g M ny cares 1 t d M ny cares Apollysius ith o cale tatellerd th Ill nth Achlist ni nand t g th

h I macte caes a h ri per od f complit rest may be required at first H 1 g 1 takes pl and th r \ any res d 1 1 ab 1 ty

f F eiberg's infr cti n may e Kochler's d ea quire rest and protection to relieve the symptoms quickly and no d sab lity results after the ep physis has united Af Il length steel in the sole of the shoe

an anterior arch ha usually is suffic ent ir atment The lesson in the tarsal navicular bone to which koehle s name is given although sim lar with re gard to pathologic eh nge treatment and p ognosis 1 not of course in an epiphysis

ROBERT P NO TOOMER MD

D ub H P Aseptic Secros s of the Epiphyses and Sh t Bon s J Am M 4s 945

A eas of necrosis involving the epiphyses and also th p imary centers of os ification n c rt in f th sho t bones have been dese ibed by different ob ers ers Unf tunat ly in most instances the lesion has come to be known by the n me of the or ginal er This has the disad ant ge of giving no hat as to th underlying pathological p occss and furthe of mplys g that meach instance ve are deal ing with an i dependent dease high bears no relation to the thers in the series. These deas shave be n kn n al o under mor gener I head ngs such as epiphisit's osteoch and tis and subchondral ne cross It I now generally accepted that thy all rep event the ame underly; g path logical proces although there I no general agreement as to the exact etiol gical agent

That some form of tra ma ith secondary was cular o clus on of the in oly da ea is responsible is held by many Embolic oeel ion has also been mentioned as ca e and end or ne dysfunction has

been invol d by others

# TABLE I -ASEPTIC NECROSIS (PARTIAL LIST)

Primars C tas t t brai body (Cal 925) C rp i scaph d (P se) Sem i d lt (K1 bock 9) P t lla (Kohl 908) Istragal (M h t. T rsal scaph d (K h) 9 8) Medi Icu fran (B schk

## Sec dary C te

V to I p phys (Sch erm nn o ) St nal d f claved (Friedrich 9 4) II d f hum rus (Hast 9 ) Cap t llum f hum rus (P Had Iradi (Brailf d 935) Ulna distal (B rn 03) Head I m ta rp t (VI La re 19 7) Head Im ta tp t (1) at re 19
tha rest (B chm 10 3)
P b ymphysi (\ \centre{c}, 0 4)
Isch p b c 1 t (Oldberg 9 4)
Isch p te 1 te (Legg 9)
F oct t If ((1 1 1) Foct t If (M 1 1 1 1 1 1 tt (S d z La sen q ) 11 d f t bia (R tt 9 0) I be t f tibia (O-good Schl tte 903) O calcus (Se VIttrails (Frebeg 94)

The path I g cal proce s prob bly no lactual death of the osl g much u I lio ed by I ag en tat on urregul r b orpt on of the old dbone and r placeme t by s c llel t cep g b thut on or r cale Cati n Thus is the am pre s that has been be v don dults in home a pte neer sibi g increasingly registrated in home a pte neer sibi g increasingly registrated in home put cast get sin invole lin the process I ngeneral the lincal fiding a enot pomnent racute and the em beno complint e c ptil ght p mad himping Ther may be ret et n I m t n ith noled patt

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R n P M reone M D

Lewl L G Ca s f Se r Pel l Injury A S g 945 47

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In rlp tients h ufir dfr mse et i

m mbranou ur th a exc ll nt results ere br & t lout wh n r pair i the d fe t as carn d ut at the t me i the nitial surgery

RICH J BE TETT J MD

# SURGERY OF THE BONES JOINTS MUSCLES TENDONS ETC

Wenger H L Tran pl ntati n f th Epiphy e2

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dual z d nd th 1 pa trular rule poced pp d th 1 n f z all case. The h e f und t 1 pph odes s the pp pent a mph poced n re sible ad press is the daper fag th d e to yet fag the post but n sought to be a say d e rang de rp nes and ac nd rable df see a rule d by the fag the first the property of the say d e to d n h h h h h b o th the case d e d n h h h n h b 1 th can b

ce mpl hab thsp d

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Description TE H Levi TH L M D

# FRACTURES AND DISLOCATIONS

Coyl J T and Thomp on W D Fractures in B tile Ca u lifes B ii U S A my M D pt 945 86 57

This is a report from a fractuouser ce of a tatom bospital during a period of sixten we ke send ing November 1943. It includes the entire Sician Campa gn and about the firsts week of the Italian Camping. There wor about 2566 pat its

In tted to it is gical's rivice of whom 969 wer battle casualties 117 patients were east a ted and 933 were ret med to duty. The mortality rate wa o3 perc at The were 636 fracturs i these 493 ere e impou d'and it rema nder ample. Fir go le were in it is fraces of compound club, and the second of 
f facture by 8 patents we re found to ha nerve injunes. See rails aco of vyh m hages oc curr d from ten to fou tee day fre injury. The post not the be nes follo in gif cut es of the finur and hum rus a d fractur of the hands r fee t a out nely poor on active! the p sitt in it activity if the raid is ulina tiba and fibula as r int. By good? It it is with fact res of the finu hich had ben put in body pice casts tras cled more comfirts by than those in the T bruk pl is I

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RICHAR J B ETT J M D

Bran h II E B II t Fractur fth Long B ne

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placing of dressings bosely in the wound and (3) complete and prolonged immobil attor a e of p. r. cular importance. Loose and completely det ch. d. part des of bone should be r moved b t bon if agments with periosteal a d soft tissue attachment should be left und sturbed. Nometall is forced by the content of the property of the pro

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## ORTHOPEDICS IN GENERAL

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# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

### BLOOD VESSELS

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### BLOOD TRANSFUSION

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m thyl nebs-(4 b) dro ycoumarin) i their im mediate postoperative p yod for the purpose of pre v t mg venous thrombos s and pulm nary embolism. The authors have found this drug effecti e in the p eventi n of these complications in p tient

the p events n of these complications in p tient ho hav had nonfatal pulmo ary embolism throm a bistory of a rev ous thrombos s or embol sm and when this drug was g ven prophylac ticall no th ombos s or embolism occurred Dicu marof should not be used nless daily and consist ently comparable pr th omb n time t sts are made since without these it a impossible to be certain wheth runsufficient adequat or e cessi e and pos sibly da gerous amounts have been giv n The authors believe that only the O ick proths mb n t me test should be us d for these determinations Cons stently comparable pr thrombin time tests de pend on the use of thomboplastins f constant p tency r on the checks g of each ne v b tcb of thromboplast n with various dilutions of normal plasm It may be preferable from the atandpoint of the cf nic an or surg on who i supervis g the dmi strat on of d cumarol that the r ports be g n in percent ge of normal pr thrombi rather th n 1 seco ds

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# SURGICAL TECHNIQUE

### WAR SURGERY

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th circ mst nces or e fat l The tre tment of multipl 1 ju es is div d d nto phases the immedate and the definitive or remote The mmed t phase takes ca e f g eral cons d rat ns con. isti g m inly in the trol of sb ck nil cal consid rations consi ting in the p event n of wou d feet on and the pr m ry reducti n and splint g i fractures Fr et es c cupy a very eco dary pl ce; th immed t i ha e a d must n t be g en und e empha The d fin or remote tr atm nt concerns t elf th th man gement of and healing the repl cem nt ol skin los and th accurat real gam nt of fractu es In this phase all poss ble methods of f ct tr t ment should be avaiable Frequently a pogr m f ustable tre tment of an ind ad al jury m t be d sca d d because f una o dable del v in sta t ng it infectio the injur s of the ame limb r 1 cwhere

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G cat impo tance atta hes t the a esthetic and t the method of ts adm nistrati n The anesthe.iol g ti key m mber I the surg cal team and re

ci ju Ignient an I gret car must be exerced bhum in the poced e bp I an I gesta should not I an I to the cases nee tip dices dop i bliodop es used not its fift nee establish did not a laber still to stool gu Local a sthet can u uslish vill d by the teh net I did by the teh net I did not its laber still to the laber

neldiffculty fit in little if litat i eed and by the potential or tult infit fith and comet mes he eer rg nellick m

be s dw thad antag Ga a dovyg ng enty an

pert with per leare to v dany me e n ti sue an ia i th b st me as of mant in aga s \ 1ttl th r cyclopr pane is added if nec rs

The most important object of the mm date local tratment of pat ts n th m lt pl 1 s th c nt ol f infect on Th fl ct d by caref land the ugh exci on ol would and the plesenti n f Lin necros s due t gross bo y d spl e m nt

i f fracti res and fractu di locat on th im m ! t tratment fthese niv ies call fracln 1 f the displac ment so that the sk i pe ers d nd the c mpl cation of pss n tadded to the tingles n \1 mb n h hth e afe hor are ntly m np l telfractur o ar cent wou d ther to acci ter to on a tio must not be nel clin compl te plaste. The pl tersh uld be splt to ent I ngth a d the d sings and r it split do t the kin th treact onary's elling can t adanger th bloo l uppl to the limb

The different timent for research gin hnth pate thereo crdfom shock and he al ond t n a ra ts it When ther s n skin Ĭos o nd of Imosta vsize liheal ithr mark abl rap d ty und ra el 1 pl ter if infection is ad quat is e ntroll d Cr nulation s nell up any d feet in a properly ve ed w und and in I healing onfil s If inf ct on | reist in s chawo nd it is de th tidq ting I the and and cone; at pocket g t s questr t a of in fect I bon to rtandfr gn bd Th ou dth nn d fu thr plate ther is on f rf e drainages dth r mos l fa sf r gnbods

rsep at d q est um Wh skin has b n1 t the pr cedure i differ t e los under th skin i made good by Ans t gra ul t ns h ch fill th d f cts nd c nt act into a firm ca but until the gra ulatio t sue is co er do th & the wound n th I d To pr m te rand heal gof an und the s les a 1 the the c ntrol finf ct n nd the r placem nt bur ol lost k by a kn h ft. U u lly quite imple form Isk ng afting ar suffe at Ep th lum will er only fit n f eted gra ul ti no The g B wou Isho ldb c e ed n pl ster u tlth g nu Iti a fl bwith the srf ce Th th ra is p p red f the e pt f skin by ctly the same m thad that sed nth to tment f burn The teat intollion a djintings fill's

the darym thod In irr inj \$th r ltnte ty and mult plicity I def in the Masebngit are often did to pol c lost b ne rt po de te al fiat fra fr tur 1 heb the 1 gnment ld ot be tr lled by rie n l pl ts nd i h h co lf t be tr ted by ea ly pe at be us of a w und A bo e gr ft sent I for th first f th t o pur n ses dit much bett tl am tipl t for the sec nd it pom tesu i add t n to pr ding int r al fixati of the f ctu

1 mmo typ f jry nai the st n Specin a h mut 1 3 b m d for miury to the vertebr I col ma alo e or s ak ciated les on a pati nts avol d'in aircraft ce he even wh n no c mplaint s mad f pain the back Als the spines of p t ents with f actu es of the or calcin r st agal s no matter h w they wer 11 ed should al ays b amin d sa fixed rout to the foot often mask mn mai discomfort in th b ck The may be an ob ou gros d dam te ni ry el where but the spine l pat t injured by sivile volue must all as be ramed b fo a ur e of treatm nt i pl an d

M rate J Serre MD

Ros J A R mo al f P ojectil Fragm to nd Imm biliz ti n f Wo d B / H J 04

Immobiliz t is a e trem ly important part of tansport t f the wu ded Gu h tw d of th' v rt bra sho ld be imm bl di p ddd poste sor shell I fractu es f th a tabul m ad uppe thi d f the femu a Wh tma plaste cust sh uld b appled Compou df etu s fthe t'b sh uld b 1mmob liz d plast r cat wh h runs Il bo th kne P etrati g perf rating u ds f the f t should be mmob liz di pl t cats Oehu drd pe ce tof all ompound fac tu s f the os calc s arri in 1 S th Minca quired amp tation Wound of the 1st df arm qui padded pit pla ter ca ts with im m blaat n f the jont bo e nd belo th t of fractue Wond f junts eq imm b is Ele t nofa e tr mits e cl ed in plat cast cut d n mate ally upon ed ma decestr to On the ther had e ess e plintin hi don m ch bam by cau i g stiff ss f the just fth had Oew d fcauto must be gren whe externites a e put up in pl ster casts

spl t ga ga grene m st lw ys be thought ! RICHAR J B NETT JR VID Born R 1 Th Heali g of Round i Me

a no ble complicat n

Gien II Md Chi 945 7 8 Fler cas f su g cal wou d r studi d 11 tepcale du fem the stadpot f the mal halglodithe trpes of the ud 4 we enfected In 3 fth 4 them fet n as du t a bre k n g cal tehnq In cas the s b uni t nach wou d The peratons we peri m d t n d va d nav base h pt l d typ cally trop cil co d tio s The p rat oom was e posed to dut andd t but tw s comp rat 1 bug p oof Ct utu wrued in lecpt cae ch h that the e t th tor pech h that the et this e efmm t thinm lhealing ceses h c tt r th r th u gical gut i u ed Care a c dered Ith g h dl 1th t t mpo ta d ry ff t as m d t protet thm the todth a b cb ug t d that l an w und don t heal w m top calcim t Jay J Malo by MD

White J C and Sco ille W B Trench Foot and Immersi n Foot N E gl nd J M 1945 23 4 5

E en since the epic etreat of th G cels unde \( \text{D} \) n p a cross the since apped Armena in un \( \text{time} \) for stibite and \( k \) definition definition of cold has \( k \) en eported in the literatur. C id does not nee \( n \) prod ce a single typ of mjury be t it de results in \( c \) end of the the shortones when become most important when cloth \( g \) food he t and shielt \( a \) it by to be inadequate and hen a great numb of \( i \) or \( d \) cliefs are \( c \) ro \( d \) etc. \( a \) with than the \( m \) server degrees of dry \( i \) t a find \( g \) mad by the American med cal-\( f \) cross with the topons hold and \( A \) that
\( f \) can be defined as

The t cnd tions to be cns dered hetrench foot a ditseaging terpart miners in foot-ar both cau d by p longed poour of the d pend nt lo r trm te to cld and m tur The kn ledgo of trench foot equired foo arms sur, s what tinded many of the Aleutan cualtes of the wan place house many to the data.

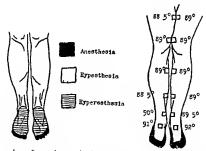
ualt es of the wa nd ho ha mad the data nd crit m availabl. The immers on foot inf mat on a btain I threigh pers I expence

with survivors of torpedoed vessel who vere exposed to cold water during a prelonged period vehile drift in the North Atlantic

S rxt rs ma cro ded leb at are forced to it thin f f dependent and immoble. This alo e pr d ce edema and f st rvati n x th its hypo protein max an idded fact t the ed ma ften is room used with ut eld Occasion llis when am n s forced to k eel or sit for prolo ged pe ds on the bott m of a rubb r f th is same cond ton s seen not ing the knees and b ttocks. In the Meutin and gis men we e forced t k lec ov in forh!

a sem sitt g po it a from the ct fourteen days m m lit g no by day and light f sts at night Du ing th speriod it 3 had litt locat we echill d thor ghlw and h d no opportunity to change foot g a Under the ec ndit in sall the c cum ta ces leading t ti ue damag 1 a cro ded l'feboat e pe n tash —expos e l'egs to cold just abov l'ecaing etnes depende ev and imm blitty n l g n l'chill g of the body

Imm is a floot and tre child the first of state of the sum of the



ſΥ h 2 5 τť trape t es f mm rs t hype ma th t m h cuta petech I h m rrh ges f feet d es Red as m d pe d cy \ y light d llag Speficil f\_pth | m soles t nes All p batt \m \ryprm t S t g beg l bily m If et tth t e k nt: +++ begi nin t Se satu book t ch vahrat figures pes t and d tect toes. T o-po t d scriminat ightly ed ced d raum f feet bee t

but fr iti t m r tu ur t so i th I tgalully b mechil I numb nis lin I je imental lesi no mil r to trench f of And im s on foot ha c be n rep duced in r bhits and in the tail firsts. In sa lors ad ft at s a these changes may b g n in the cou se of a l hours hut in the t neh s here leet g t et a deh lled mo e r l l 1 f exposu may be necessary The condition at sea lift rs fr m trench fo t be cause the m n n cr ded lil boat do n t have the pp fun ty to alk and thus t traumatize the r umbel I t II tauma occurs of ct n u ually f llo s and olten e d in m ist g ng en In 231 ca es of tr neh foot tr ated in the Aleutian campa en amp tation fon the thefect va qued and in S cases the greate pat fone rm re tes was lost At another h ft 1 7 of 35 s v e ca s from tttu r qu red late plastic p rati n titer ea ex po ure infecti n a d gange ne a e f reunately less fequent-only | foo pat ents | t his leg an | 2 patients uff reith i fone r more to is led the authors to e nelude that trench foot cau es m tt nive and s r d mg to the s th n loes immers on fo t

When first cen alt rexpo ure in ither con I ton th f t re cad ere n col) s oll n and blis t d Mas i gangrene from the ankl may ppear im n nt b t wh n there is no infect on nd p ope t atm nt adm nist r d the reco rs capacity na ing Re y takes plac n t t ges an

ly hype em c tage and alt rien dolfb osis jou as pring d a capacity may be II th

ir\_ent in b thiha

The hyper mice phase I velops a oon a the legs rmander culti reco rs The abo 1 I damag d tussu cau s a as dltr ne The are bound girl t as in the d p s is nd hat rad at ng t the urf c m kes the knfve hot (fg i) In add ton the upc nei l reult myb pr foundl impair d sish n b pet ch I hem r hages fr m ruptur i capil is a dithe mb ses (th boutan m 11 d ss la Increa d cap llars perm ab lity ults n extra a ation f p ote n ch fluid that cann t b rem ed by the ing diverginates. The account I r the im bitrng and it fib s Th hat heh ruses metaboled m nd 1th cell for xyg na d th in dequates | ru al rulat n results in ut no an mand by gpana oon a th nerves r co er Th s n at nr c ry take [lace rapidly in thep mlp rts fth feet but in ca e the toes may emain an th tefr la fra a t to e ks th bype em

nd th c cult on returns t n m l th bleb forbadth k pel wthact n mount I caring Th patents the lder cae th n can't into kb tinth rca sth Li bem atrib nt f th toc firm t I and all g sanful and did it it is its of the k a d up to la le fth it n men me pettd alm nth aftre pouc sh ed tophy and thunn ng of the p derm

int use fbrosis and d positi n feollagenaby tts nerve end gs and subcuta u blood ves el To m seles were i fitrated and their fibrils pa atet hy a netw rk ol scart's ue the e tent depend. the smitial evudation of fibrin and ti sue anoxia lin rea onabl to assume that this e plains the h pain rigid ty and cakness f the fet a condition thich impro es aft r 1 to e ght months when the collagen c ases to co tra t In some of the w case p in has been troublesome for o t two year Other fact is contribute g to the d ability a eth neak ess and dirmtes condry to the i ? e nt n ed mmob lizati n and the hype esthers that may accompany the return of ensat on after nerve injury The role of malnut tion and antim nos s should also b considered i the path ness

In treating these cases ne must keep the rate of If his feet and pr t et him ag inst rupture of the hleb and th format on of pressu sores in th wight be ring are s of the anesthetic skin, if treptococcal infects n b gins m st gangren and loss of the l g a apt to foll w Th ge eral effect of cold hould b combat d by w rming th bods with blank is and bot wat r b tiles and givin b t tea coffe r soup nternally A nutrit ous high prote a high tam n diet should be gi en as soo as tol rated If the tal ty I w Plasma transfus our to combat book and hypoproteinem a evaluabl

The inj d f t m st be kept cool while the bod is a med Thi can be best ecompl h dby expos ng th I gs t a cool oom temperature and blowing r them with fan bl wer The feet sh uld be rubb d o paint d with a str dism f ctant a d a ptic pr cauti ns should he t t a ith sulfonam des a d a booste dose of tetamb t gold Elevating the legs helps drain edem find a d shrinks th El sters Unles the excessive w face heat s r duced cyanosis i creases bli ters well and the pa becomes acute This i du t an ano is of th tissues ad my lad to created at a asation of fluid and necrosis of the kin.

Upon arrival of the pat ent at a base hosp tal th am I cal t atm at an uld be carried out until the hyp rem a du to absorpt on of d ma ed tiss e has subsided and ciculat in through the thrombood subcut ne u vascula bed r co ers. The surface cool g hould b p shed ntil pain the eds d d lly a cut n us temperatu e of i om 75 t ? F sh uld b ca hed This co l g educes th m ta blen d for or gen to point where summer quantites can be ppl d thro h n 1 red cap llary b d In r ca es cooling w th o m s my of uffic ad c b gs may b ne es ary cut h ld bet knntt en t toes toom ch

If gangr n has alr ad) d el ped befor the patent trs th hospit l prode débrd m at and p mat kng ca l th i tae es ry Ev trmt ca be av d lly b c nservat of the toes a 1 d tal pe tons of the feet rutat Early mp tat n f lg | cu ble only n f l m at ng 1 mph ng t thr atened s pt cem b sha g ne

V st man p ras good lb ache ed if the period of pa nand igilty culd be shorted. d Al though symp the timy is quite ill g cal in the all hippermicistag elec of the a constrictor tone rould r le e the late d blig symptoms by hastening the bisorption of collag and fir us t a d by not sight hipsy first and collar each culat in though the injure d e temte.

Some auth is a crope of the source of the so

O cof the a thors sa may just ally mid caes of trench feet after a c nside bil I gth of t me had clapsed and was imp d that sure pt bil ty of thes cases this tical polongation [mpt mid thing to do for thoped ceet fith me

cha ceal dysf nct ons

M ny of these case it r ch and mm rs nf t
can be pecet d in campaig g dc w tere n
dt sby prophyl et cmeas s floot hygien by
mp v ment in pot et cloth g and by s fety
m rs at ea Faly merg cy t trant d
term esho m choth foot a d toes can be d

dh lng th d llty wll cont n c
Ro EKT K. Bt. to M.D.

Less A Repot n Imm rsi n Foot Ca life f mil B til fAtt A 8 8 6 945 57 F m h s obser tit in the treatm nt 15 m

m rs foot casu it es the a th das th fill

The most mpot t pr cat v fa tors nv 1 d i the ca at a fith e are re () cas d us to it to a ta fith e are re () cas d us to it to j t loced m tall tumper tr (but above free 1g) as a es lt funcr ased conduit to dith constat the tall the conduit to the constat the tall the conduit to the canduit to the candu

d vitamia depl t nfr ml ekoffood nth capil l ry pe m bility d (d) th fiects flow l llood i th pat nt who w i d

M tof the tsue in) is presumable on siduring this o-ell I thang the period that high the these rebots of more than a llendrologic choking that ies will I d Such high fifth the of the act of the distribution in the control of the second of t

fid Such hkng tes itb fl dis pr bably r lat dt e ten v vas dilatat n po sibly the es It of the accum I tion of a to ichi tammel ke substa ce in the tissues a w ll as other pro cats of ctors of the immers on pe io l ized blood ves el s u Th ombo is of small doubt dly rel ted to the sudde 1 crea e 1 [ e ur within the t sues I the e trem tes The extent of tissue n crosis and gange is obviou ly dependent upon the extent a ds or ty f the choke g of th to ues a d the thrombosis and the degree f re ca alization of th end vess is I the 't emities The deposit on of large amounts f fibr ogen rich transud te and f coll genous a d fibro material is eventually r spons ble f co tractures harden ing and pain in the soft tissues of the feet and toes

The therap ute implications a conce ned vish the prec ti acro to lot the c tutpo agod flu ds transudate into this swo of the extremite. The mass resistant suggest thems I es are (a) elevation of the locite ten times (b) imm data application of the locite ten times (b) imm data application of the locite ten times (b) the locite ten times (c) the locite ten times (c) the local application I c ld to the extremity (d) the intrave ous admit too for his ton the locite ten times (d) the intrave ous admit too for his ton to the peter of the locite ten times (d) the intrave ous admit too for his ton to the peter of the locite ten times (d) the intrave ous admit too for his ton to the peter of the locite ten times the locite ten times (d) the intrave ous admit too for his ton to the peter of the locite ten times th

(c) the local application 1 c ld to the extrem to dd the intrave ous adm t ton of h per ton c age ts (plasma gluco c) t c trol t and t t a d (c) the poss ble imp cm t f oc stret r t e by the use fadr lin

Car f Local atoms r decat the tamoutation

Caflobe attons ideat the amputatin revisor through the fee fable as the trism transligous bonds have p vided as t fetoryfue to alres if forst inding a dad quate alking In standing the peers to fastall tare s tail the mechanical arthes felect a digan its and must describe the tobal neither by which the tath so the table seeks at tobal neither by which the tath so that the table seeks at tobal neither by the might on the tath.

g all to this eccessa y to the spring ke take flot aches to The pring stelling tudilst ip in the sole of the shoe althit thans ersite the barroth sole if the shoe placed in bick of the ditale difto trevised metatarish in materially imposed alk g i it en c nt ualcae a d'hygie of the fet shoulib treel

] IL VAR T MD

# OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

McG rkl H J nd Silvani If Selection of th Time fo Grafting f Skin to Exten i e D fect R titug f m Deep Th rmal Burn i S t 945 285

La ge a eas th t have bee de ply burned sh ld b co et d with epith l um by ma f ki grafts the r liest opp tu ty ltis ces a y h w t wat tl hock lt t n in b l j t

flud del et lyt balance al functi n d ma nd t zem a h e been cont oll d Alo t is de able to d la th graft gu t l th p th l m bas been rest r l po taneo li to llar f cond degr burn T a it for ep thel gat n of la ge f ll th chness def to ho e er even th ugh the en ta m ll iabl pth l l i l d that e ntually might p ad to c er the rea i usually u i Gr ft ng h uld be d n early eno gh to sod th pe d I d b litat n lten as cr ted with th plese c I lag gran latig are s s v ral ceks after a e ere bu n M ntenan e f nutr tio with particular of rince t a d thigh : prt; and vitami Ci tal especi lly if ea ly sking aft

gi c ntempl ted It i difficult t designate an exact time that all at if all of thes requ ements Surg cal ci n sh uld be do e in a fully equipped per ting room n fer bly at some tim bet een the cond an i th I eksfll wight burn The pred of exc in f but ed to wes and early skin er fti e m v be s d b th f r b r ed patients t e t d i i tills the compessint speof dess g and tho p n hom coagulum prod ei gdr gs uchas tannic ed ith le nitr t rthedjes rud ign

I nesth teisra ited

Th bu edares ndsu und g him recl ned tho o ghly with a ditrige t liton d dap d with t lelie The poposed donra a prepar d m l rl but s pa at ly All cr t c t su s cied a much ablet e be ngp era d a possible The di ctio difficult dislo It s p eferable to apply kin gr ft at the same ope a tio f the o iti n of the pati nt p rmits b t occa in lly it may b ces a y to delay fraf l vs b f re pl ing the grafts at cond p rat SL gr fts fit rmed te theke r rmo lfr m d tsit igth lad tt Blair m th 1 a d ith c tt ns t es tefisdt th dndda If th a allabl d n ste do t pro de n gh g ft to cover the dice taes completel the

g Its a e cut t sm ll q ares (posts fom 15 to 2 cm sze and are plac in ne an th r sas jos able or rthe enter & thes a e not sutured D o graft d ra re ered thas gle I ver of fne met mann ted thag s bae co tan gat! ept c tment and luminou c mpr in are apil d In children or in dults near jont a light platr co g may to

the ompressade g lipo tit ld es ings ar left in pl ce for t echst the graft g p oc lute if it bee m s n m se them ea li r the pro edure shull ke redouts the pat g om nd cor~ dres gshould b reappl d tonce Appa ntly ea ly gr fting of sk [1] a tes der bramnmzse tractu t formits Sm p tients vill d o add t e dur but others ill requ pl stice mit contract res that have r'ult d in spite for g It g Io such pate to the all closure! wund by the applicate noing afts fit m th cknes probably Il permit ea l plaster JVEKARIM

## ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

W lkr J M J W Th Total d fl mlit me t of Actin myc | with P ichin i 5 1 045 1 373

I 6c s f cti omyc f rabl eath btain I wthp clinth ray alth ghth 17 uppedart hitt lim nemn te I of nged t atm nt u ually frfrms !

eks " t qut 1 that a c mb nation of per Th auth `b I llin nl ulfo am 1 m ght b employeit : tag a dist of the sity f 1 10 1 n dit t penicilin who the mil fb ads rng WT HNA LES ND fb

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Le itin J and Weyrauch H B Acute Ob truc rin of th Colon Am J R 1g 94 53 3

Acute colo e bstruct on due e the to ca ce or olvulus presents d'finite dist g i hable ro t g n l g cal f d gs hich permit an acc rate di g

In malig ant less s of th sigmod the rate of tamor growth s slo and permits the body portion to the tumor to mandata its to and e hie the back pressued lates the occum and the as ending clon

On the other hand virulus if the sigmoid: a sudden twisting of the intestinillo p. This closed portion rapidly becomes ditended with g. ring ut of the bony pelvis and at times re chest the

d phragmatic le el

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\text{Nine case reports} \] ith film and \( \) \[
\text{d} \] a g

illu tr \( \) g the \( \) i w of the auth is acc mpa \( \) ith

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\text{R \ B \ G \ MD}
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kmp F ll \ R ys in Diagn si and Localiza ti n of Gas G ngr n L 1 Lo d 945 48

In the present area is of g s gang en have ben far fe erth nthey ver in the a of 914 trans. By but the dease till remained on of the per cut.

19 8 but the diesse till rema on of the prici | all c uses of death from wound War Mem No 188 ed by the Brit h Army

1943 gi the all symptoms disgns I ga gingrine as follos 1 Increas gipsin in the woind a e with po

s bly the appeara c rincra e of i c I swelling
2 A i gpule t in the ab ce of contract
hemorrh g nd it shock hab no recome

3 A change in the m tal attit de of th p tient h h) discult to defin ith accuracy this chinge may be e f mental p thy or s met mes upho

with or without estless ess

4 \ 0 nd which is relatively dry ratm t sh sath nd chage the xpo ed m l nd fat at t mes being st in da plum col r l m h m ly i Occa nall n pl ined att ck l om ing may occur the cally sit ges

Use the ately not eff the sgns alon fice the distribute and lilaepents guest part to distribute and singular some models of the same to distribute and singular supersonations.

mrd cunmth fat lty t mght beah d Thue txrays in the d gn olg g gr not just a matter of det cting gas lithea veral caus thrthing gag n when g e

r t gas in the sett es

'll feel wull n tray e di pu tur
me permit air t nier the tises e met mes g

m s permit air t mer th tises m t mes g

may be seen in the depths. I the vound b i in most cases a is not observed unless the part is cent ge ographed. Air may e tend throughout the entire length is a limb but it no er infilt tes the muscles unless it is forced in under pessure. The amount ind distibution of air in the tissues vay according to whether the vound i open o closed and vith the mount if it su hich has be n lost. If a wounded part is not mobilized mements active. pas

ne tend to such air to the ti sucs.

I on of the authors een it can sa reentge of gram of the chest showed gas outling the fibers of the pectoral maj muscle on the left side as well as ell markeds betta cous emphysema in the neck and the left arm. The patient had a small pe ettat ing wound of his chest in the pecto 1 region and

and the left arm. The patient had a small peterating wound of his chest in the pecto. I region and with each bill at he could be seen to blov air firm his chest into the pect rall missile. The congeno graphic picture of this muich was very like this per rance given his full minating given gangrene.

O ce thein; ed part s placed complet is at rest ari q ckly ab bed in twenty four hours the mo nise as derably less not thin the edays all but a trace has g ne The rat (ab orption eems to by in different tiss es being quicker fr m muscl and syn vial memb ne than fom elr

ti such If the tiss e is d ad thre is n absorption. Men other factors in treatm at man influence the roc tg nographe petur. At can b int. d ced by chang g as pack removing a stitch or by ring tion. In on case x in a sho ed a geat d al of a r, which h d be n int od ed the t the surgeons knowled during the man pulation of n int amus ular p neutil n drup. Soft paraffa gau e tends to

mps the absorption of air and holds it a preket as the skin inth and When this ture preshave becomes led off min pulstoned or usually suck more air into the tisses but a quent ope thou my permit it center. Thus the teatment ad pt dimust be considered with a segment expensively.

Local form t n f gas n the depths of a ound by g s f rm g r g n ms g e a roentgenographe ppearane whe che lo ly resembles that g en by it As rule it i mpos ble to diff r it this g s f om a e c pt by serial roentg nograph ex m at it is and only thin f the observe is acquated it h ll the details of the patints treat ment s b quent the acced at

Local gas format on dot n t necessar ly mean a on of th 1 ung ti wes by organisms if r as a rule th bubbles i m na hemat m ar unl a i gn body m dead tissu. In uch cases ther mabe n client jugns of ict na d the oentgenographe signs d n t n them 1 es dems d su g cal mit rentio

It is a difficult to dicide hen gas liming or gan in ha bigun to in ade the loos cellul rits

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es The firt th tith wond is dirt. fam ? ndf I m !! only me ns that an inflammat ry react on taking place and dies a t necessaril h which organ, m espon, ble If ras can be i it crackling in the ubcut neous t es rean be seen b bbl from th depths f th w und this does n t me n that the ga neces ril due t ras frm gorgan, m. fritm bea E nthepes ence i na obic bacteri m non the ebe ond the fact th t the w und is infect d nd m n wo nds so af cted how no trace of g \ \nae ob c ceff 1 t s almost always accompanies true g i g ngr and gas f mation t the loos cill t s es soften detected roentg n graph call n d 2 ce f n fect n in the m cles whr s chin call the ft nb tlittl i deat n fitsperence ceptwh n th gas is beutan ous

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to y, prefe lly rad cal resection e en n tho e ca es in which r g n llymph node metastases are found as these can be taken care of by p stoperati e

1 radi tion

All of the o cases were treated postoperatively with x rays. The results were very encouraging in deed as c mp red with the high mortality rate report d by oth r authors Six cases were cured permanently nly 3 v y advanced and inoperable cases term nated f t lly Most impress e is the report on an in perabl eticul m cell sarcoma in a man of thirty thre we rs A total dose of 5 50 r entgens was g en in t o se es (serie 1-4250 oentg as dur g fifty e en d 3s 2 d s ses 2-1 000 cents us during th teen days) The patient reverdativas fr f ymptoms and ahl to Lt and o chalf years afte the peratum P loat o in onnect on ith a l ter append ctomy lor cald the stomach to be fre f many turn Op rable cases ere t eat d ith gast ie resection

and nost perature roomingen therapy inth daily dose 123 300 400 freningens with a copper of the fit; from 50 t 60 cm focal ds the and a total cutaneous do 1 fit in 300 to 3000 centgens d g flom four to s w k on each of two ante or and t oposte for felds. Supplementary ser es w e give n't or three months later in some cases

I reoperate er entgen treatment is desi ahl and would prob bly further impro e the results but i most cases it i hi dered by the difficulty of the

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The mat al report 1 by th a thor e mprises 33 caes of ca ca om fth la vns nd hypoph in the dath ce tral institute R d thr p in H ls nk I land ince th f daton of the

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For the p sow of e al ating the res lis fix at ment the for all cases of turn f i the layn and ding turn of the ante or wall were the wing the ras ca es of turn of the layn to make a tal fix 8 Se entry eight of the patents whom fix fix pears or more and of the ewer curd a rate of 8 percent while of 37 pt ents with popphary agic leam; twe estill in a pafter fix ars or more hut only 10 fithes to 10 he bed 5 d as cued an abis lute cuer te fonly 8 percent From s he er fall these ca evar con dered together wew last that 22 all but cuers may 18 ft years rul be not but cuers may 18 ft years rul be now 18 lut cuers of 8 per can the first sea for the sea of the

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### MISCELLANEOUS

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To understand the rat onale of the t eatment it s neces ary to explode 3 misc neept ons (1) that rad not tm nt add further damage to an ea al re dy to he vily adiat d (The n cross is not a d rect seq el to irrad at o hut a r sult of the inade q ate blood supply of cart u smilart that ob erved in kel id f llo 1 g burns or in simple s r g cal scars Sm 11 d e of rad n in a concent tion k than e tw ntieth f that req ired t prod ce ervth main the am time allow complete r covery of the c lls in all thes instances) (2) that t ss e rec very de to th lphar ys of the or tment (The izat nd n. t) of the beta and gamma )s the char aloemitted during the proces of decay of the radon is 1 than e one bund edth of that fr m the alpha ray ) a d (3) that the ontment n th strugth u ed h no eff ct on a m I gnant les n It is the authors impr ssion that th alpha rays in

sm Ild ses stimulate a d prom te the growth of vascular existence the end of a parallel in the effect f c ysm Ild e froentgen ray in the tr atm to findiammat r is est ins The authors p epa eth on timent by br aking

Thi f shis p epared ointment is thin polied

bernlyw tha pat hat the uice to b trated a d b t em ofn rm laken s rounding t Theth ck. ness of the tm t ummat rial sine th alpha p rtcl h rng f b fractin n mill meter in va 1 e but layer f fr m 2 to 3 mm will guan d ag nat th 1 ss of adon and thus nsu e a moreu i m tre ghd in gth ent eapplication

The ointment co e ed by a rubber dam or celloph n the edge of which a e secured to the skin by adhesis plaster to p event diffusion of the radion gas

The cone tration of the ontment varies from zat o colome per gram of va cline. As a rule applications are lift on for eight hours and epecated one a week for the con analy tage. The add to not to pe entinol nith it must make snod fifter ence as far as the pin tration of the alon not the tises is concerned. In the interval bet on the add in treatments unquentium a dishorted (op ce t) or unguentum of im tribuse vith va cline are applid.

Altog ther 60 ulcers er treated Of these 2 prov d to h recur ences f the original malagnant keison 41 have been completely heal d and 8 im proved to such an e tent as to be no lager su pected f being recurr nec. No example of simple necrosis has failed to respond Infect aleks frespon e constitutes and the such as failed to respond Infect aleks frespon e constitutes and the such as failed to respond or for librant recurrence.

The authors iso sed the method in ric left in cases of chinc are set ulter tilling sip rate are. In meareash I diptompth, simprived and only I failed to show any response. The chronic culcers in scars I lioning burns in duringer in hich in radiation therapy had been gin likewis healed completely.

To cale r ports r incl ded in b ief rés més to llu trate the m thod of p ocedure and the subs

que t cl nical course of heal g

The c nelusion s dia n that the cellent mined tresult will 1 fty the uf the radionism in not by in posturedate onal ulcers b tal on their being n chron culcrat lesis 3. The time s too short asy cit to as ess the perm in rey of the res. Its is believed h we if that the fill do application could be este de! in dthat the mithod may all o be of a tane in militars sure.

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tw lat al filds where u d the small ant 1,7 field added coase of ly what he we le gem tas tasses in the gon fith necka poster rheld nith a do fine metast we add ned Dily dos ges consist dong cralled o or tgens he tas much as goor t gens ha be no mploy d. 4ll entig dosages we calculted ag mist the kn Thetti dosage was tedf in 6 000 to 7,000 routerpass and the tial period of tratment thu lasted ab ut a mith.

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f the cell in ll the e instances) () that to ue recov ry is due to the lpha rays of the or tment (Th I nization d its I the bet and g mma 38

hich are lso mitt d'during the proce s'of decay of the rado is less that neoe hundedth of that form th alpha r ys) and (3) that the or tm nt in the trength sed h s no eff ct on a mal gnant lesion It i the a thors impres ion the the alpha rais n small doses stim 1 tea dpr mote the growth of a

There may be a pa llel n cular op thel al tis the eff ct of ery small do es f roentgen 3s in the treatment of infl mmatory lesions

The authors p par their o tment by break g

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The frank prordontment is then ppl d Ibrll) with a pat lat the ulcer to be trated a d shout tem of norm laking rrounding t Th thick ness of the ntment immat rial sin th alpha p rticles hav a nge of o ly fr et f m li m ter in vas l n but a layer f fr m 2 to 3 mm will guard gainst the los of radon and thus insu e a more un f rm t ength du ing th ent e applicat on The outment e e ed by a rubber dam or cell phane the dge of th chares cured to the skn b adhes ve plast rt prevent diffus on of the radon ga The concentration if the 1 tm nt varies from

024 to 0 060 mc pur g am of asel ne As a rule applicat o s are f ft on for e ght hours and epeated once a we kf thr o an aver ge The addition f opere tlanol to the intm t makes no diff r enc as far as the penetration f the ad n into th t ssues is conc ned In the ternal bet en th rad n tr atments unguentum ac d bo ici ( o pe cent) or unguentum les mor huae with va eline are appl ed

Altogether 60 picers re treated Of these o pro ed to be r cu ences of the or g nal mal grant I sion 41 have he is completely healed and 8 im proved to s chane t nt as to be no long suspected f being course ces No ample of imple n c osis has filed t respond Inf ct ala k of respons con stitutes an alm t sure sign of m 1 g ant recurrence

The authors also us d the meth d in 7 r c lc t ant case of cbron c varicose leer totaling is enarate

eas Ame areas beal d promptly simproved and only a falled to sho ny respon Th ehronie ulcers in scars following burns and surgery in high no rad tion the rapy he d been given like se heal d e mpletely

To ca e reports at in luded in bri f résumés t illustrate the method of proced e a d th subse

qu tel cal course of healing The c clusion is d n that the e e lient immed

tor sults well just f) the use of the radon o tm nt not le postirradiat on al ulcers but lo in the b n gn chro ie ulcerati e les ons. The t m 1 too short as yet to assess the p rmaneney of th results it is bel ved h e that the fill faprle ton could b ext nded and th t the method may als b of a 1st ne in military surgery

# MISCELLANEOUS

### CLINICAL ENTITIES-GENERAL PHYSIO LOGICAL CONDITIONS

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## GENERAL BACTERIAL PROTOZOAN AND PARASITIC INFECTIONS

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ARTHUR JIESE MD

## DUCTLESS GLANDS

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# SURGICAL PATHOLOGY AND DIAGNOSIS

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#### TABLE I -PELVIC FINDINGS

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## TABLE I - PELVIC FINDINGS

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# **SURGERY**

# GYNECOLOGY AND OBSTETRICS

An International Magazine, Published Monthly

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OCTOBER 1945

NI BE 4

# II THE VALUE OF THE VAGINAL SMEAR IN THE DIAGNOSIS OF UTERINE CANCER

A Report of 1015 Cases

JOE V MEIGS M.D. FACS RUTH M. GRAHAM B.S.
MAURICE FREMONT-SMITH M.D. LOIS T. JANZEN B.A. and
CAREY B. NELSON B.A. B. t. M. ch. sett.

7 IRL1 accurate diagnosis of cancer of the female genital tract has long been , the goal of gynecologists Ewing (3) states that in 1931 14 464 women died of cancer of the uterus or 12 per cent of all cancer deaths were due to this one type This is exceeded in frequency only by car cinoma of the stomach. Ewing arrived at figures of an average of 10 per cent approxi mate 5 year cures for uterine cancer He cal culated that the possible cure under ideal con ditions ie intelligent public skillful and experienced pecialists and modern equip ment would be 40 per cent The discrepancy between the po sible rate of cure and of actual cure bears a direct relationship to the time at which diagnosis is established and treatment institute! We feel that the vaginal smear technique for diagnosis of uterine malignancy 1 a definite forward step in the carly recogni tion of the disease

In 1943 we (2) reported 220 cases studied by vaginal mear for cancer. This report con firmed the previous findings of Papanicologic

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and Traut as to the value and accuracy of the vaginal smear as an aid in the diagnosis of uterine mal-mancy. Since our last paper we have studied an additional 795 cases making a total of 1 oi, cases studied by this method with a total error of 1 oper cent. The patients for this study came from the Vincent Viemo rail wards and the Tumor Clinic of the Viassa chusetts General Hospital and from the private practices of several physicians.

## NEGATIVE CASES

Of the 1015 patients 861 showed no evidence of cancer Of these 36 per cent had biopsies either of the cervix or of the endome trium or the whole uterus was removed These proved negative diagnoses are listed in Table 1

In addition to those shown in Table I our negative group also includes 48 negative post operative and 89 negative postradiation patients (Fig. 1). These women had proved malignant growths of the uterus treated either by x ray radium or surgery and are now clinically well. Also included are negative cases patients who did not present enough evidence for malignant theses to require

operative procedure. In this cries of 861 negative cases, in it taken positive diagnoses were made by vaginal smear. These we regard as mit takes since repeated biopsies were carried out in all cases and in none was micro-copic evidence of tumor found. This represents an error of 29 per cent in negative called positive. These mistakes will be discussed in a later paragraph.

## POSITIVE CASES

In this series of 1 o15 cases 154 were shown to have cancer on microscopic ection. The positive cases and their pathologic diagnoses are shown in Table II. Of these 154 positive cases (39 endometrial and 100 cervical cancer) to cases were incorrectly called negative by vaginal smeat. This an error of 103 per cent (see Fig. 2). Of these mistake eight were in the endometrial and eith in the cervical

The mistakes in thi group of cases fall into two categories. The first includes smears in which cancer cells were present but were not een on the original examination of the slide On review of these smears the cancer cells are so obvious that there could have been no ques tion of interpretation. These cells were missed because every field was not examined Seven of 16 mistake were of the type The second group are those in which no cancer cell were found even after the slide were reviewed We must assume that in these 9 instances malignant cells did not exfoliate or that deseneration of the malignant cells had o curred We are including the in our mis takes They actually present a limitation in herent in the method Of th se 9 6 are from cases with endometrial cancer The fact that

TABLE I -PROVED VEGATIVE CASES

Carres Ch n rs t P lyp End on tall hyp of Fb d E d m tn M sc lla eo my At phi d t Secret ry dml m d m tn m P liferat for here co

cell from endometrial carcinoma fing e fail to appear in the va<sub>b</sub>inal secretion equ's the lower diagno tic accuracy evident in the

the will review briefly the criteria for the recognition of cancer cell in the valual secu tion More extensive descriptions includ technique and stamin may be found in the mono raph by Papanicoloau and Traut or L. our previou publication ( ) The basal or are round or oval cell with green cytopla n and an active vesicular nucleus. They or may vary in size The second group 1 the precornified These cell are larger and more transparent than the basal cells and have a smaller vestcular nucleus. The third group a the cornified which are similar to the precornified except for an acidophilic cytopla a and a pyknotic nucleus Endometrial cells are encountered occasionally in the va ind secretion These cells are very small and have a small vesicular nucleus with very little

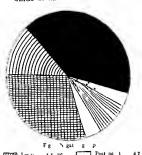
cytoplasm

Mali nant cell show a ood deal of variation much more than is seen in the ni tole of section of the same tumor. The cell sheddin from an epidermoid cervical cancer are of twypes depending on whether the tumor abshows any differentiation. The differentiate cells show extreme variation in size at shape. They may be extremely elongated resimblin very closely a mustle fiber cell except for the long, hyperchromatic nucleu. The may be rounded at one and with a long talletted the process of the cell The differentiated cell was a adequate amount of cytoplasm but it is almormally distributed.

The characteristics of the undifferentiated cells are as follow (1) they occur often by groups (1) the nuclei which are hyperchromatic show marked variation in size even to rooper cent (3) the nuclei stand out a ansist homogeneous background of cytoplasm in

TABLE II - POSITIVE CASES

Epd me dea mafth rig Reest t pd me dua n me fth is ad oct me fth t Ad oca me fth t Ad oca me fth t R td oca n me fth tru Ad set then fth tru Cerme fth ge

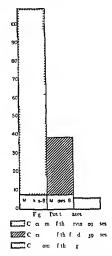


Clim lly g ti I thol gocalty a g t S 7 pe c

which cellular borders are often indistinct. If migle cells are encountered an increase in nuclear size in relation to cytoplasm is the most unportant diagnostic and Menocar moma of the cerviva also shows cells of this undifferentiated type. The diagnostic criteria for endometrial can

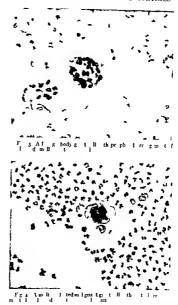
cer are similar to that for undifferentiated crivical cancer. The cells have large nuclei with little or no cytoplasm. The cancer cells from endometrial cancer are more likely to be present in clumps with the cells in a dense mass. The size variation of the nuclei is not as great as seen in cervical cancer.

In reviewing our mistakes in the group negative called positive (lake positive) we have found certain cells probably histocytes which often give trouble in making the correct diagnoss. In our 3 g in takes 5 were in correctly diagnosed positive because of the presence of these cells. There are 3 types of histocytes. The first and most familiar is a large cell with vacuoles containing migested material such as red blood cell and leucocytes. These are easy to recognize and are not the surce of trouble. However, the next two surce of trouble.



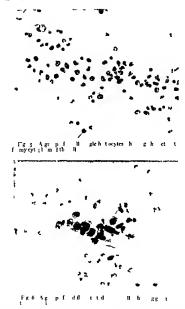
groups have proved to be very maleading. One group comprises the foreign body giant eell. These are very large cell with sometimus as many as twenty nuclei. The nuclei are apt to have a characteristic peripheral arrangement (Fig. 3). Occasionally, however there may be so many nuclei that they occupy the whole cell. These foreign body giant cells may be interpreted as malignant plant cells if careful attention is not paid to the regularity in size of the nuclei and the adequate amount of cytoplasm present. These foreign body giant cells contain many nuclei which do not vary in size appreciably while in the malignant giant cell the nuclear size varies a great deal. The

notice in roscopic il accionsol ha i gn bod gia. Ils m notice in roscopic il accionsol he ri and tha probabli ha m re il ng f re gn bod gi il re ro ps [ ] re e h I magiu



nuclei of the cancer cell stain much more deeply than those of the foreign body guant cells. In the malignant guant cell the nuclei usually fill the entire cell so that only a thin rum of cytoplasm remain via ble. The difference between the two types of cell can be readily seen in a compari on of Figure 3 which demonstrates a foreign body guant cell and Figure 4 which demonstrates a mah, nant guant cell

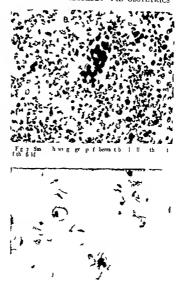
A third type which leads to onfusion is the small single histocyte without ingested material. These cells often occur in groups and are then apt to be mistaken for undifferentiated cancer cells. Figure 3, shows such a group Occasionally a group is found which is phagocytosis an epithelial cell and in this instance it is easy to classify such cells a histocytes. Other groups are much morthful cultivation of the criterian time criterian contents of the criterian contents.



for differentiating small histocytes from can cer cells The most important one is that the small histiocytes have a foamy vacuolated c)toplasm which is absent in the malignant cell Second the nuclei of the historytes do not vary markedly in size and finally the entire cell is smaller than the undifferentiated cancer cell Compare I igure 5 with Figure 6

In 2 cases in the negative group false po 1 tive diagnoses were made because of the pres

ence of normal endometrial cells which were mi taken for cancer cells. The reason the endometrial cell prove troublesome is that their nuclei are hyperchromatic and there is very little cytoplasm Since malignant cells have hyperchromatic nuclei and little cyto plasm the reason for the difficulty is readily seen However the cytologist should remem ber that nucles of undifferentiated malignant cells vary a great deal in size This is not true



F 8 Samo F aft dannitt flbet!

of the endometrial cell where the nuclear size variation is small. It is important to remem ber that when there is bleeding from the endometrium normal endometrial cell are often encountered.

Another type of cell which has caused some confusion is the atrophic cell of the basal layer of the vagina. When a va-inial simear is composed entirely of basal cells aberrant forms are often encountered which are not

ca y to cla six. These cell account for 8 million takes in the group of negative called positive. We have found that a sati factory solation to this problem is to change the vagard cythelum from atrophic to comined by the administration of stilbestrol (1 mgm per day for 10 days) as originally suggested by Lapani colaou. The basal cells will be completely to placed by comified cell and at the end of the stilbestrol treatment the confusion atrophic

cell will have disappeared. A comparison of Figure 7 and Figure 8 represents this change

The 7 remaining mistakes in the negative called positive represent smears which on re examination still show in our opinion malig nant cells. Two of these women have had hysterectomies for fibroids and no cancer was found The remaining 5 have had biopsies only and in a case the biopsy specimen was unsatisfactory We have no explanation for this discrepancy other than to postulate that perhaps a small tumor may have been missed at the pathological examination. In our previous paper we reported a case in which no cancer was found by the pathologist on rou tine examination but cancer was demon strated after many subsequent sections were cut and examined Te Linde in a discussion of this very problem reports 11 cases of early cervical cancer He says In approximately half of the cases several well trained gyncco logical pathologists were unwilling to make the diagnosis of cancer from the changes noted in in all instances lafter biopsy specimens operation the entire cervix was cut into I locks and in many cases much careful search ing had to he done before an area of actual invasion was found

#### DISCUSSION OF CASES

To illustrate the value of the vaginal smear in the early diagnosis of cancer we are ab stracting 8 cases diagnosed primarily by vaginal smear. Two cases represent endometrial cancer 5 cervical and of the 5 cervical cancers 3 are carcinomas in sulv of the cervix

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These cases illustrate that the va\_nnal smear is of great value in the di cover jo di unsus pected cancer. In 5 of the cases the cancer was not recognized although it was in that portion of the cervix which could be easily vivillated. In 2 (the carcinomas in situ) the biopsies did not establish a diagnosi. The ca e in which both pj ometrium and carcinoma of the endometrium were present is an excel lent example of the aid the vaginal smear may render in establishing a diagnosis of cancer.

The case with carcinoma of the endocervial prosents a special problem. If a woman has an early symptomile s tumor in that region mere valual examination of the cervix will not rule out the presence of carcinoma. This it true of course also in the endometrial carcinomas. By the time symptoms appear the tumor may have advanced to a stage where it is incurable. A variant smear may the close the presence of such tumors in an early stage.

#### DISCLASION

For the diagno is of uterine cancer inspection and palpation have been found to have obvious limitation. For this reason various

and to earlier diagnosis have been sugge tell na 1931 Schiller advocated paintin the curva with a solution of iodine. The normal in wed the glycogen content of the cell. Because of the glycogen content of the cell. Because of the lack of glycogen in leucoplasha and cancer the cells tam very heitht or not at all. In fortunately crossons and inflammation aly fortunately crossons and inflammation aly take the stant to a very limited de ree so the picture may be confusing. The greatest value of the Schiller test is that it indicates those portions of the cervus from which the biopsyshold be taken.

Another method proposed for early darmo as the colposcope developed by Hinselmann. The colpo cope has been found to be of hitl practical value in examining large numbers of women not becau e of any error inherient in the method but becau e of the gynecolosist unfamiliarity with the marnified cerva.

The most important method 1 the biop 3 It establishes the diagnosis However the biopsy a not infallible. It mu t be taken in that portion of the cervix where tumor i present. If the tumor 1 clearly visible the site of the biopsy may be easily determined. The chances of mi ing the tumor if the cervix merely presents a suspicious appearance are greater Two of our cases of carcinoma of the cervix in silu were not demonstrated by biopsy though one was reported as ? car cmoma in situ and the subscouent negative biopsy was taken as near the same site as nossible Davis reports that in a study of 1200 cervical biopsies 258 sections showed no squamous epithelium and 300 were without gland to sue It is eyident that e en assuming the mo t accurate hi tological diagnosis the efficiency of the biopsy in this group was only 7. per cent It is perhap important to note that in our 1339 smears only 14 smears were unsatisfactors for purposes of diagnosis Biopsy moreover requires certain operative facilities and it i not practical to carry it out on a large series of pati nts not su pected of cancer A method which can be accompli hed more easily and 1 till accurate would be a Hen the estagmal maners to the restora i makes he tal receive. The months per Territorial transfer in the receivement of the re used red in h tandpo. han tases hi i cal with the de-tha h i fee nega es - de-tha e fee nega es -

great aid in early diagnosis. We believe that the vaginal smear represents such a method We certainly do not feel that it should re place biopsy but rather that it is a very valu able adjunct to biopsy. Its advantages are It can be carried out on a much larger group of women due to the ease with which a pecimen may be obtained. It does not require special facilities Any doctor in his office may take a vaginal smear and send it to a central laboratory where it can be examined by tech nicians trained in the method. The region examined 1 not limited by the size of the sam ple taken the smear takes a fair sample of all cells desquamated into the vaginal secretion It is not an expensive method

The varinal smear has the disadvantage that it does not show the grade of malignancy moreover in some instances it is impossible to say from the study of the cells desquamated into the secretion whether the cancer is cervical or endometrial.

## CONCLUSIONS The vaginal smear technique is an ac

- curate method of diagnosis of cancer of the uterus

  2 Vaginal smear and biopsy are comple
- mentary techniques which used together will enhance the effectiveness of the diagnostic clinic
- 3 The most important contribution of the vaginal smear technique may be in cancer

control Large numbers of women may be screened and those with positive smears studied further by biopsy

4 We do not regard a negative smear as evoluding cancer not do we regard a positive smear without biopsy corroboration as an indication for surgery

#### SUMMARY

We have presented 1015 cases studied by asginal smear with a diagnostic error of 4 o per cent. Difficulties in diagnosts are discussed. The accuracy of the method is emphasized. Mistakes are evaluated. Eight early cases of uterine cancer demonstrated primary by vaginal smear are discussed. The value of the method for cancer control is suggested.

Our statistics have been reviewed by Dr Herbert Lombard of the Massachusetts De partment of Public Health

#### REFERFICES

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# THE OPERATIVE TECHNIQUE OF COMPLICATED VISICO VAGINAL AND URETHROVESICOVAGINAL FISTULAS

S \ HAYES OBE FRCS FRCOG L t tC! IIMS Lh 1d

THERE is a general impression for tered by the resterated statements of textbooks that to cure a vesicovaginal fi tula requires a superlative degree of skill and a large number of special instru ments It is true that quite a number of fistulas we see have been operated upon by others Masson and Wilson 1941 report out of 48 cases had go operations or more than 3 per patient Even so it must be re alized that to attain a high degree of skill at any operation requires practice and as vesico vaginal fi tulas are not common it 1 not pos sible for the average operator to obtain the necessary practice and knowledge of the van ous type of complications. The literature though extensive is not sufficiently detailed This arti le summarizing 16 years experi ence is written with the object of assisting the intermittent operator as our opinion is

intermittent operator as our opinion is that provided the operator has a good the oretical knowledge of the variou technical defauls and complications he will obtain good

results

With this object in view 3 types of compleated fistulas have been illustrated to indicate the detail of technique 1e () lateral type (Fig r 3 and 4) Adherent to the descending ramus of the pubs (and usually associated with partial de truction of the urethra) (2) type with the upper portion of the urethra involved and which requires reconstruction (3) large fistulas

All og rations have been by the varinal route (flap plittin, type) first described by Colli (1851) later by Lawson Tate (1889) and extended by Mackernord (864) Refer ence is invited to the detailed review of the literature and bibliovraphy by Nagub Pacha Mahlouz (1933) To hum and to all other writer on the subject we offer our acknowle ed,ment and appreciation

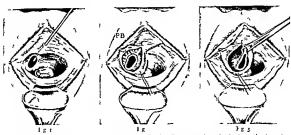
Fmh Departm f Ob d Gyn ! gy Ka Edw d Med cal C lle- d Th Lady W II d Hoop tal. TYPES OF FISTULAS AND PRELIMINARY SITUY. A careful preliminary study of the fistula is essential. Simple fi tulas involven the blaider and free from or with shi ht fibros: are easily cured by adopting the principles to be described Complicated fistulas pre-nti greater difficulties owing to their varied nature as a result of destruction of tissue and resulting fibro is. [Karely are two the same. Any of all

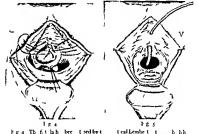
of the followin, complications may be present Stenosss of the agina in all degrees the mot severe bein, when the normal vaginal wall are replaced by rigid fibrous tissue and the onfice admits one inger or partial stenoss the result of patchy fibros; may be present

Fibrous bands The commonest type 1 a transverse band at the junction of the upper and middle than of the vagina causing anhour glass contraction in the upper portion of which is the cervix and often the obscured fistula. The consistency of the band is frequently of cartilarinous consistency.

The st e of the fistula cares from panpont to the whole vault of the vaggan in which case the bladder is prolapsed. The shape varies considerably and is governed by the site and amount of fibrous it is use e, a common type i a transverse oval one or both end bein fixed by fibrous it use to the raim of the pubes. The position of a fistula is not constant. It may be central and easily acce sible or his type behind the symphysis. A common and difficult site is high and disperaing from sin h laterally, and behind the decendarizings of the pubs to which it is adherent.

Mobility of the certx is often impaired and mome cases the cervity is completely im mobilized by a solid mas of fibrou it ue thus considerably increasing the diff culties of obtaining a good exposure. The instula may be completely immobilized and attached to one or both descending raim of the puble or to the posterior surface of the symphysi or it may be in the center of a mass of fibrous tissue.





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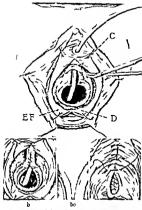
Finally the urethra may have been de stroyed inpart or rarer(2 cases) initsentirety in an average complicated fistula half the urethra t absent to be considered later. The upper urethra may be occluded by fibro is

Careful presperative study of these many points will be well repaid and during this

study a plan of operation should be prepared Ifnecessary the patient should be an esthetized

### OVE OR TWO STAGE OPERATION

The large majority of fistulas can be cured by one operation (of 8<sub>2</sub> operations 78 were one stage) With large fistulas a two stage



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operation based on reducing the size of the fistula 1 worth considering e.g. Case 502/42 quad p ra hada r thr v al fist la h h dmtt d th e fi ers th thra ema d On Ju 8 04 th fet 1 th bldd sm bled d los de a a rubb cath t On July 3 os th fet la m bt d adm tt d ting The ur th a empltly eptf ch ttp Th fit la m bhz d b t m bhz t po bl A cath te tur Rulterd

We are very favorably impressed with deliberate two stage operations for large fixtulas. As the unethra is usually partially absent care should be taken to confine the first operation entirely to the reduction in size of the bladder fixtula and thus reduce the formation of fibrous tissue in the urethral area.

### PREOPERATIVE TREATMENT AND PREPARATION OF THE PATIENT

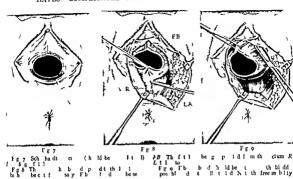
Cystitis is treated by irrivating the blade. and vaging twice daily with normal saline of temperature not higher than 100 degrees F If hotter than this a local hyperemia i has duced which increa es onzing at operation Excertations of the vulva and this have treated by sitz baths followed by an ointment of equal parts of zinc oxide and landline 4 mild aperient is given the night before and an enema on the day of operation. The operation area is shaved in the ward and prepared on the operation table by thorough washin with either ether soap or soap and water-the area being irrigated at the same time with sten! water. The area is then dried with cotton wol and painted in hthe with tincture of indine or other antiseptic. We have abandoned the use of drugs said to be unnary antiseptics

#### THE OPERATION

Instruments The special instruments used coosist of (:) I twin Moore scleft palate sessors—curved on the flat. The cutting edges being 134 inches long and the points pecially ground to a long bevel (2) long tonsil discring forceps—one pair with and one with out teeth (3) angular nasal forceps [Lucs] for swabbing (4) May os round bodied her dles No 18 with No 0000 or No 00 catgut for the variant mucosa (5) Bozemans needle holder (6) a sharp pointed cataract or any small sharp pointed Amfe (7) a standard set of gynecological instruments

We have found no use for the large vanely of special scissors knives etc devised for fistula work the simple instruments here de scribed have sufficed for all purposes. Re tractors (except perineal) are rarely used a they obscure the valour.

Fostion of the patient dramp operation and exposure of fishuls. The correct satting of the patient and operator in order to provide the maximum exposure is of first importance and requires care. Shoulder rests are fixed to the table and the patient is placed in the lithotomy portion. The operator six as low as possible on an adjustable stool. The table is now raised and titled and the buttocks are raised to a



height and inclination that provide the best possible exposure of the fit that The resultant position is usually with the patient at 15 de grees and the vulto-at a about eye level. In justiments are made as required during the operation. A good head light is essential. The laba minor are retracted laterally by suturing them to the inner portion of the thighs the sterile sheet being included in the sutures.

In the majority of complicated cases it will be necessary to provide for additional exlosure by means of Schuchardt's incision which can be made on the left or right but more commonly on the left side. The left fore finger is inserted into the vagina and the posterior wall is depressed toward the anus This safeguards the anal canal and stretches the labium Cutting laterally the operator makes an incision in the left labium at the junction of the middle and lower thirds. This incision is continued upward through the vaginal mucosa and on the posterolateral wall (still cutting outward) as high as is necessary I sternally it is carried downward in a curve with the convexity outward to a point midway between the tuber 1 chn and the anus The inci ion can be deepened as much as is re quired and if necessary the laster ani

divided By means of this meision the vagina can be turned into the shape of a wide funnel with the fistula at the top and excellent exposure is obtained Double incisions (right and left) are rarely needed. A modification of the incision (Hayes 1937) has been described which enables skin flaps to be fashioned and turned into the vagina for the treatment of stenosis of the vagina.

Figures 7 8 and 9 illustrate Schuchardt s incision (the beginning of which is too medial) used to overcome stenosis caused by a transverse fibrous ridge in the vagina and indicates the exposure obtained

Hemorhage during operation is usually considerable. Infiltration of the operation area with adrenalm; ruinims to 1 ounce reduces the amount of oozing. No attempt at he mo tast by means of forceps and figature is made. In visible bleeding point is controlled by underpining with needle and catgut. Ooz ing and moderate bleeding are disregarded. The first assistant constantly places gauze swabs of suitable size in the vagina which the operator uses and discards. Time hould not be wasted in endeavoring to check any bleed ing which doe not come from a spurting te sel The principles and steps of operation. In order to clarify the technique de inbed illustrations of 3 types of complicated fi tulas drawn from sketches made during operations are shown. It should be noted that even with perfect expo ure fistulas are not so near the surface as the artist for technical reasons depicts. They should be visualized as being misside and not outside the vagina so much so that in some ca es the operator is working very high up at the end of his instruments and by touch.

I Incision of aginal mucous membrane and exposure of the fistula or urethra or both (Fins 1 5 7 dotted lines) It will be noted that the edges of the fi tula are not pared as if so the bladder is liable to retract and postoperative hemorrhame may result. In a cases excision of the edge of the fistula resulted in post operative hemorrhage and the hladder was completely filled with blood clot With the present technique no such complication has occurred The first cut around the fistula is mad about - inch from the edge with the object of marking out the incision Joining this an incision over the urethra and one to ward the cervix are then made. The inci ion is deepened to the connective tissue plane over the hladder and urethra by holding the vaginal mucous membrane with toothed for ceps and cutting with the curved scissors When the connective tissue plane has been entered the fistula edge is held no teriorly the lower blade of the scissors is shipped in and by cutting anteriorly on both sides in the incision line the vaginal muco a on both sides is separated up to the incision over the urethra The vaginal mucosa is next separated from the urethra by cutting with seis ors and blunt dissection. The re-ulting right and left flaps are now freed widely by holding the flaps with toothed forcep and by seis or di section The flaps are then adjusted and sutured to the labia minora vell out of the way and in a position that will give the best exposure of underlying tructures This pro ides for per manent retraction. It is advantageous to make the incisions a long as possible

Mobile atton As sutures under tension will cause edema and eventually cut through free mobilization of the part to be sutured

must alwas be the object in the Firms and 9 viewed by holding them at eye level and at an angle of 45 derive indicate what 8 meant by free mobilization. In both the cases there were dense adhe ions hold in the fistulas immobile 4 free mobilization any prittion of the fistulas could be freely moved in any direction. The edes were early approximated and suture could be performed without tension. The ideal to aim for 1 to be able to seize any portion of the fitule with forceps and pull it in any direction with aboute or moderate freedom. While this kiel may not in every case be attained it hould alwas be aimed for

anways be aimed on as the same as the day and a stated may vary from simple fibrou band to sheets of fibrous to ue of cartila moss hardness. Whatever the type and degree of fibross present free mobilization can be worded only by cutting through any obstructions with the curved sessors or breakin them down with the first fin.er.

Before adhesions are cut or broken down it is important to orient the position of the bladder by means of a curved probe or the first finger. This will obviate a traumatic per foration particularly when operating on large fistulas.

Fibrous hands and tissue (I s 2 FB and 8 FB) are palpated by the first finger and then cut It will often he found that after cutting the superficial adhesions deeper and denser hand firmly uniting the fistula to the descending ramus and symphysis remain Very often they can be freed from the bone by u in the index finger or by palpating with the tip of the scissor and then cutting Althou h we prefer palpation and cutting with the scissors if free mobility does not result we have no hesitation in utilizing the first finger with considerable force to break down any connec tions between the bladder urethra and the posterior surface of the symphysis pubis and descending rami Figures 8 and 9 iliustrate fibrous band in s tu and being cut to provide the necessary mobility

When the urethra is destroyed special treat ment is required in regard to mobilization and in dealing with these cases it is ad sable to consider (1) The urethra is a tube for the conduction of urine from the bladder Large portions of it can be destroyed but if the remander can be joined to the bladder perfect function results even if the normal length of the urethra is not restored. (2) Providing one third inch of urethra is available satisfactory reconstruction can be effected. When the upper portion of the urethra is destroyed the remaining portion contracts. After it is completely mobilized it can be elongated to approximately double its length. Liven a small fragment of urethra is of value and can be utilized. (3) A successful risult will depend on (a) careful planning of the incision (b) special mobilization and (c) suturns (c)

The de cription of an actual case will clarify

the various points

CASE 7 /3 lat t as a sept para ha ghd 6 n rmal d the 7th a ab mldher, 1th baby b m lal fil d by inconti ence C tract d utlet T t o ap i m d Mach d Mach 93 th ugh a Fpue as 100 ac bpub cagle Thitla Ote. ti lis Sch hritie ut (the arr hgha ibh dth hghaibh dth smphs s dm tt dth nd x th bl II 1 I d I crion as mal ac e igt dit il e ligures \rubbreth et halb neass ith ughth rm to (th u thra t the bill Th mid th i as s nly g th migpt u thra the dg of heh e fth d te e ct a ly h deiter po ly I practe th lintb se nife mith eath tet the did th 1 o pln ed such m e th t the mooth t u n b tur d bs tical utu c th cath tr (F g 6b) th truct e th

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both desa df ally d pt the ti ue n hich th catheter was cated The bl ider th n mob liz The cult a afr lym bl dur thraa dbladd ad t g the to a pece of tissue hich as t f rm the up; po tion of the th 1 vertical Lmb t str was the erted c mm c g at C on the side of the prethra and including the to edges f th 1 t frm the t and lateral portions of the reconstructed urethra the o t th bladde alf a d nd ng at D Figure 6 F gure 6b sho s the suture passing fr m c mpl t du thra on t the bladd wall A econd support g Lemb t sutu e as then I serted Pl cat n sutures I re s ried th bladd r !! (Fig 4) Th rted unt I the cathet r was a t htft The ag nal murosa s as the 1 sed (Fig 6c)

3 Suturing. The object of suturing is to the care with which suture particularly the first are applied. Patience and accuracy are essential and if the operator is not satisfied that he has the correct portion of tissue on the needle another attempt should be made. The same accuracy should be aimed for as in an intestinal anastomosis and as the working space is often confined a considerable amount of maneuvering is often required. Yound a fistula is an area of fibrosis and this area which is tough and strong should—with a much other tissue as po sible—be included in the first suture.

As the edges of a fistula are not excised edge to edge suturing is valueless. The edges must always be inverted with the forceps be fore the neces ary tissue is picked up with the needle.

The standard suture is placed vertically as by this means it is easier to reduce the lumin of a dilated unthra and to plicate the bladder in the region of the new internal sphincter (Fig 4) In irregularly shaped fistulas the sutures have to be placed in the most con venient position. It may be necessary to suture transversely or diagonally and on one occasion a triradiate suture was necessary Lvery effort should be made to insert a second Lembert suture or to cover and reinforce the first suture line with borrowed tissue. If this cannot be done the need for the careful in ertion of the first suture is even more ap parent. In high oval fistulas adherent to the rams of the pubis it is advisable to use two suture and fir t suture each angle gradually working toward the center where the sutures are tied

#### LARGE FISTULAS

The size of a fistula is no criterion of its curability. In many cases a large two finger fistula is easier to cure than the small adherent type (Fi s 7 8 and 9)

Case 46 /39 Pat nt uffe d from c nt n nc foll wingth birth fad dbaby aft 3 days labor Sh h d hado e prevo pe all n Operation u s p rform d May 9 939 thro ha Sch chardt n c n Th fi t la dmitted fi rs n shigh nde d at nded id ly to the left and the symphy ght The uppe to the d of the ureth de tr yed M biliz ton of bladde in h d tion of many dhe n and tho s band h h b hand the symphys and that had to both desce dig The trus and ad x n r absent to cooo nd to oo t tcal Lemb ts sutu The bl dde n spleated To pr vid c v r th bl dder the pot or vag al Il w s fr b sepa at d from the ect mad ut d tran es ly Res It cu ed

The accompanying illustrations depict clearly (1) Schuchardt's in isson and resulting excellent exposure () the free mobilization resulting from thorough freeing of adhesions (3) that large fistulas can be cured if extensive dissection is made

The internal sphincier and large fistulas The question will arise-How is sphincteric control resumed after operations on bladder fistulas to 3 fingers and due to the of lar e size ie destruction of a large amount of tis ue? The answer is that provided the fistula an be clo ed and the area at the junction of the urethra and bladder reduced to an optimum size sphincteric control will result. We in variably insert a No. 8 rubber catheter before or after closure of the fistula Plication sutures in the region of the bladder urethra area are then inserted until a fairly to ht fit is obtained If it i deemed neces ary the urethra 1 then plicated

#### CLOSURE OF THE VAGINAL MUCOSA AND PACKING

Interrupted sutures are unserted and if ooz ing is excessive a small piece of rubber glove is inserted for 4 hour. The vagina is then tribtly packed with gauze which is removed after 8 hour.

### POSTOPERATIVE TREATMENT

The careful attention to detail is as impatant as the detail of operation. There are to principles to observe namely (1) to keep the hladder empty and (2) to keep the stitches detail.

Bladder We have utilized various mechanical and water pumps for the pumpos of the pumpos wheeping the bladder empty and all of suparticipations of the pumpos of the pumpo

Statches The va mai packing a removed after 8 hours and nothing more 1 done for a days-after which and once daily a small bivaive or posterior speculum is inserted intithe vaning and the stitch line is exposed-the patient being in Sims position. The stitch line is then thorou hly syrin ed with normal saline a 10 cubic centimeter syringe fitted with an intramuscular needle being u ed. This method enables the stitch area to be very thorou hly cleaned and is far superior to douching The vagina is dried with cotton wool and painted with acrifiavine and glvc erine Stitches which show signs of infection are removed and the remains or all stitches are removed by the 8th day

Even when the wound breaks down the regular and methodical cleaning described should be continued and the catheter retained for at least 21 days. A number of our wounds have broken down but with such treatment have eventually healed. Liven if this does not happen, a clean wound has less resultant fibross than a dirty one and a econd operation is therefore easier.

If unon is sood the catheter which is re moved daily—cleaned boiled and replaced for 10 to 12 days is then removed for pends of hours daily. These periods are increased

of hours daily. These periods are increased daily and when the patient is able to retain unne during the whole day the catheter 1 completely removed. The stay in bed aver a es 21 days. The catheter is kept in the bladder during the night until daily blall 1 control is obtained.

WHEN TO PERFORM A SECOND OPERATION
FOLLOWING FAILURE OF THE FIRST

Theoretically the tissues should be in good condition 6 weeks after the first operation Experience, and the following case notes show that contraction goes on for some considerable time after operation and small fistulas tend to heal spontaneously

CASE 164/38 Operation was performe l October a ly admitted a finger The u tencomics r 2 1937 Th Thermats ith cr The nur leit Schucha dt's inc n was mad ur thra as mobilzed E te sie diss ct ea d thh dthe ymphy s Th bl dd i e ly mob liz d Result failure Second operati as perf rmed F bruary 8 938 Th fist 1 if gr d m t th bl dder as prolapsed The n i bladder were mob iz d O ly was possible R it bladd co tol s a p n point f stula in the urethra but ther March a 038 th fstula had h aled p ta

Case 981/37 Op ration for rect vag nal fst la lal bee p io m d Octob r 2 937 O \p 1 4 938 as c nd operati as p rf m d Th 1 t 1 lm tt d fing rs Th t ic rificts # h ethra was 1/ ch l ng Rem a t t ic rifices re ы re v s bl but the c rs c l fud The nt urethra am bhed Th bld b hin i th smphsss equedfgr1 sect fair a gad unt bil bil gn rgrig sph net re nt l Ap 1 6 03 s it fald hetula admit n f g 1 t t 3 m th b t dd t to the prat sprimd Viay 25 938 Th nibladd wmbhzd Thefg later Op rat u th ftulahse t ted t rinp t picat n i eth anibidler

These two almost identical cases serve to illustrate important points i e (1) instulas re sulting from an attempt at repair contract to mantable degree and no object is gained by an early second operation. We fax the minimum average date for the second operation at 6 months (2) pin point itsulas resulting from an operation invariably heaf spontane out by

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RESULTS AND PROGNOSIS

Of 33 cases previously reported (Hayes 1937) 6 only were of simple type In the 1944 series 2 only were simple. The availability of such a large percentage of complicated cases is undoubtedly due to the fact that the large proportion of simple fistulas are easily cured and the failures drift into the larger hospitals Two patients died Case 1030/30 of uremia on the 4th day Case 31/36 of blackwater fever following a very easy operation on a 1/ inch fistula In the former patient the fistula was large and the operation difficult. The ureteric orifices were obviously compressed by the sutures and the latter should have been freed on the 2d day In 5 cases rectovaginal fistulas were present and were operated on prior to the vesicovaginal fistula. In 2 cases the urethra was entirely absent. Three patients presented the unusual feature of complete absence of the uterus and adnexa-proved by intraperitoneal palpation They all had had long labors and the conclusion is that due to compression and gangrene extrusion of the uterus and adnexa occurred Light patients required two opera Seventy three of 85 patients were cured The results in 3 cases are described as partial cures having pinpoint or probe fistulas remaining on discharge and patients were ad vised to return if not cured. Invariably this type will heal spontaneously and as the na tients did not return it is reasonable to presume that they healed If these cases are added to those cured a percentage cure rate of 89 85 per cent is obtained which consider ing the variety and complications encountered is adequate proof that the flap splitting opera tion is a satisfactory operative method

It is interesting to note that we are unable to prognose accurately the result of an opera tion Repeatedly we have recorded prog

attempts at closure

nosis bad and the result has been a perfect amination but invariably make one or more cure and ice versa

REFERF\CES Case 26/44 Cic trizati n f a i h ch d m tted n n r The ur thra a n h lo to ef r tho nal fit law adhrut to b thrm fth pb Moblz ton sd fficult ad not complete On stue olyw psbl Pgosabd Rslt crd

This experience has been fairly common and we now do not as es operability by ex 

## SAPHENOFEMORAL LIGATION WITH THE IMMEDIATE RETROGRADE INJECTION

HO McPHEETERS MD FACS Mane pols M st

HE purpose of this paper is to discuss the treatment of varicose veins of the lower extremities by means of pre liminary ligation of the offending veins together with either the immediate or subsequent injections of the sclerosing solution

The discussion is based on an expenence guned while doing and caring for 2,8 ligations in 19,2 patients. Of this total number 633 were bilateral ligations. There were 89 cases in which the short or lesser saphenous was ligated. Females predomnated 3 to 1 jogs females to 678 males. This preponder ance of females is explained by the fact that many women come for treatment for cosmetic reasons only, while most men come only when the pain and ache in the leg is severe or when a definite thrombophlebitis has developed. When the varicosed condition involvo, only one leg it shows no predilection for either—it hit 107 left 127.

As to age groups we found the large t number of cases in the decade between 50 to 60 years 33 per cent with the next in the 40 to 50 year group 30 6 per cent 13 patients were under 20 years 7 per cent 49 patients 70 to 80 years old 2 9 per cent and 1 patient was

81 years old

The normal upward venous flow is carried on by three main factors. First the pressure of the arterial blood through the capillaries and into the veins second the pumping effect of the calf mu cles as they contract on the deep veins while the patient is walling that the suction force of respiration which causes a negative pre-sure in the che t during inspiration.

The theory that the preliminary ligation is the 1st and perhap the most essential step in the treatment i based on the now proved fact that the flow [blood in any well devel] jied case of varicoses in isactually in relitate it is flowing downward toward the foot

instead of toward the heart as should be the case with all venous blood. The more marked and well developed this flow has become the more important it is that the ligation be the first step in the treatment.

The reverse flow of the blood develops be cause of the los of function of the valves in the vens in the thigh and lower leg. There are usually 5 to 7 sets in the great saphenous through the thigh with one set just outside the saphenofemoral junction and at times one set in the deep funoral and iliac viin just above. There are several sets in the veins of

the lower leg

The loss of valve function develops for several reasons. First and I believe foremost a hereditary factor is present in fully so per cent of the cases By this I mean the patient is born with a weaker than normal set of vein wall through some sections. Under the stress of normal life exercise work with its attend ant straining and the increase of intra abdominal pressure etc these vein walls stretch and give way so that the vein lumen may become several times larger than normal Thus the valves will be mere cusps on the side of the vein wall and of little value Careful taking of histories has often shown this to be the case. The second most common cause is infections During sickness there has actually been a bacteriemia with the infection causing damage to the valves and scattered areas of the vein wall. The weakened wall dilates under the u ual venous pressure and then more rapidly later when the valve function is lost The third most common cause is preg nancy (10) Many have argued that the growth of the uterus mechanically causes pressure on the iliae veins and that the normal veins below ju t give way under this strain This is not the usual case for the varicose veins most often lagin during the first 3 months of preg nancy when the fundus; still small and freely movable in the pelvis There is much evidence

to prove that there is actually a disturbance of the hormone, (11) with an overdevelopment of some such as proge terone which permits the muscles of the vein walls to soften and stretch (re) Fourth there is the ca e of congenital variose veins and the arterior enous fistulas. These anomalies are re-ognized soon after birth or during the early months or years of life. They are most difficult to treat

What varico-e veins should be ligated? The patient with small varicose veins, the size of a lead pencil with a very slight or no reverse flow can well be treated with simple injections Any nationt who does have a well developed reverse flow should be studied and then a ligation block should be made above that point wherever it may be Many surgeons believe that any vein large enough to be in sected should be ligated first. In my opinion this is too radi al for with proper selection fine results have been obtained in many hun dreds of cases over a period of years. Person ally it would seem that any vein that has been injected with care and there has been a recur rence should be ligated. Any great saphen ous a centimeter or larger in diameter at the saphenofemoral function or the short saphen ous the same uze at its junction with the popliteal vein should be ligated. Any vein with a definite reverse flow through a perfo rating vein and which does not come from the saphenofemoral junction should be li gated where found The possibility of the presence of compensatory dilated veins must always be thought of and especially so after a history of phlebiti Compensatory veins may developfollowing a blockage of the deep system but after the deep veins heal and become re canalized and again are patent and function ing we should study the varicosities present and if they show the tinding of typical vari co evens with a marked percussion pulse (14) PPT (Fig 1) at the groin and a reverse flow they should be ligated and injected just the same as any other varicosed vein io any Isubivibai

The Trendelenburg (17) test is the one mo t commonly used to determine reverse flow (15). It is simple and easily done. With the patient standing the varicosed condition is studied. The percussion pulse is followed along the

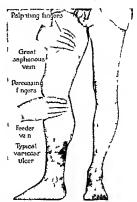
vent to the groin. The patient then less dand the leg; elevated to empty the varce-ties. Pressure is then made over the sight poseumonal junction to block, any outwart for The patient then stand. If there is a marked reverse flow from the groin when the pressur is suddenly released, the empty varion in will fill rapidly and the test is positive.

If the varicosities fill slowly with the normal accumulation of blood from the did al arabut full more rapidly when the pressure at the groun is released then the test i still positive We also have the condition in which the reverse flow is outward through a perforating wen in the thigh or lower leg. In this case the vin will fill rapidly and not become more tenewhen the pressure above is removed. This is negative test. Then there are case while have some of the reverse outward and down ward flow from both, sources. This is called a ward flow from both, sources.

Trendelenburg double test
The Perthe test is the on

The Perthe test is the one most commonly u ed to locate a reverse flow through a perfo rating vein in the lower thinh It is made by applying a rubber tube tourniquet about the leg and having the patient walk rapidly for 50 to roo steps. The normal pumping effect of the calf muscles with each step will such the blood inward from the varicosities and the the varico ed segments above the tourniquet will remain filled while tho e below will be emptied If the test is positive the empty veins will quickly fill from above as the fourni quet is removed. The multiple tournique! test of Oschner and Mahorner (9) 1 merely the reapplication of the Perthe test at different level until the offending vein or veins are located Gerald H Pratt uses two bardages about the leg to locate the perforating ven They work well One banda e 1 applied 107 tightly from the foot to the groin When the patient stand it i removed from the top down A second bandage is then applied from the groin downward leaving about 4 inches between the banda e In the way the per'orating veins can be seen as they appear It the te t is negative and the large varicosities are compensatory veins then the veins below the tourniquet will enlarge as the patient walks rapidly and the patient will complain of pain in those areas and the lower leg

The bandage test is the final proof as to whether the enlarged veins are varicosed or compensatory It should be used on all cases that are not clear with the other tests. Here a firm 4 inch bandage (the Ace No 1 four inches wide has been found to be mo t sati factory) applied about the lower leg from the knee down to the toes going twice about the ankle and foot in a figure of eight The patient is then told to walk four to five blocks very fast. If the patient should develop a pain in the lower leg and in particular if this should increase then he may remove the bandage but if the pain does not increase as the minutes go by then he should walk three blocks rest walk four blocks rest walk five blocks and then report back to the office for examination with the bandage still applied. If the pain should cet better then he is to leave it on until bed time when it can be removed if uncomfortable If the varicosities are compensatory the pa tunt will have severe pains through the lower leg and foot when walking but if they are tyrical varicose veins with a stagnant and reverse flow the patient will feel better the faster he walks and when he returns after a fast ten block walk his toes will be pink the edematous leg will be much softer and the patient will admit that the leg feels better than it has for a long time Many do tors do not grasp the mechanics of the compression bandage and the pumping effect of the calf muscles on walking Many patients have actually been told never to wear a tight bandage on that leg It is a common thing for a doctor to let the patient dominate the situation and when the patient says I do not like the band age etc he is permitted to go without the support even though the lower leg may be edematous and badly swollen. When the patient has had this kind of treatment in the past I admit that it is a case of salesman hip to persuade him even to try wearing a bandage on the lower leg long enough to make a good test let alone for treatment of an inflamed e lematous leg vith ulcerations Again the doctor must decide whether there i evidence that the patient has pain or whether it is a case of fea on the part of the patient and lack of confidence in the present attending physician



Dm traigth pecu typ llyfed gth The tsaph thigh pratth po tim led The prouse mid by the fig. rs. tth k t ttd pre ed by the fig. fth palp tig han tt d p ith paip t g hand e (F m th r I j lon T d Hem h d) spe thigh (F m

At the time of examination we must not only settle the question of the reverse flow and that a ligation or ligations should be done but we must not forget the patient himself How often we see a patient die of shock from a burn while the doctor is meticulously earing for the burned area itself in order to avoid a later infection if the patient lives So here we must always be on the lookout for a compli cating diabetes for a cardiorenal condition and for the presence of a very toxic thyroid with the varicose veins by far a secondary factor

The diabetic patient stand surgery poorly until he i insulinized the decompensated heart patient should be digitalized and then he will gain much relief from the care of the varicose veins. The worry and pain of bilat eral ligation with an excessive reaction may

to prove that there i actually a disturbance of the hormone (rt) with an overdevelopment of some such as progesterone which permits the muscles of the vein walls to soften and stretch (10) Fourth there; the case of congenital variouse veins and the arterioxenous fitulas These anomalies are recognized soon after birth or during the early months or years of the The are most difficult to treat

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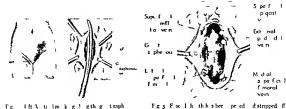
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The Perthe te t is the one most commonly used to locate a reverse flow throu ha periorating sem in the lower thigh. It is made by applying a rubber tube tourniquet about the leg and having the patient walk rapidly for so to 100 steps. The normal pumping effect of the calf muscles with each step will suck the blood inward from the varicosities and this the varicosed segments above the tourniquet will remain filled while those below will be emptied. It the test is positive the empty veins will quickly fill from above as the tourni quet 1 removed. The multiple tourniquet test of O chner and Mahomer (o) is mer h the reapplication of the Perthe test at different level until the offending vein or veins are located Gerald H Pratt uses two banda es about the leg to locate the perforatin tem They work well One bandage is applied very tightly from the loot to the groin When the patient stand it is removed from the top down A second banda e is then applied from the grom downward leaving about 4 inches between the bandages In the way the perforating veins can be seen as they appear If the test is ne ative and the large varicosities are compensatory veins then the veins below the tourniquet will enlarge as the patient walks rapidly and the patient will complain of pain

in those areas and the lower leg



Fg Ift V to lime k g f g th g t saph tgr Tra sem k h l f fig beadth bel th | If td b I co th gh th I se l h th g th g t ph

mark is best made by a simple scratch with the lack of the tip of a scalpel If you warn the patient of it and do not press hard he will mind it but little Additional marks are made lower in the third or lower leg if other heations

are to be done there

I referably the leg should be draped eparately so that it may be rai ed high from the table without contamination. If bulateral ligation i being done both legs are so draped One per cent novocan is militrated through the area care being used to carry it widely enough to give good anesthesia

After the skin and superficial fa ca have been incised a secondary infiltration is made of the deeper layers. As the dissection is actived downward and about the saphenous vain injection should be made all of into the potential state of the vein as soon as possible is the sheath carries nerves and the patient otherwise will complain. Two or 3 cubic centimeters of novocain is then injected about the vain jut at the foramen. If care as to the injection when the patient of the patient was the proposed of the patient of the patient. As a rule about op cubic centimeters of novocain is used for each side.

The inci ion should be adequate about a necles longer in the obea individual as Ju ld (r) so aptly said inci ions heal from ide to the and not end to end. A hort incision fredi possito incomplete work and makes the chances for technical complications far greater.

The dllb hesh bee'lg tedsep ily The t ph dy t be l mped d

It is these avoidable complications that cause calamities in this work and we should try to prevent them

Discetion carried out directly down and under the preop-rative scratch mark will reveal the von. The vein can also be located just internal to the pulsations of the femoral artery or in the soft triangle between the lieads of the sartorius and the addituctor longus muscles. It is very simple to open the sheath and to peel it off the vein. The peeling process should be done from inside the sheath and more novocain should be injected as the sheath is peeled off (Fig. 2 and 3).

As a rule the vein is found about 2 inches below the saphenofi, moral junction. During the dissection stag, it is important not to use forceps with teeth as so often the vein wall is thin and is easily forn. The vein is lifted up and a curved 'livter cystic duct clamp is stipped under it. A clamp is then placed on the vein distally and the curved clamp provimally. The vein is sectioned a stump one half to three quarters inch being left on the di tal end. This stump will facilitate the injections later.

The fat 1 retracted upward and the proximal stump is followed to the wall of the fumoral vein. All branches are carefully leated. The is very important and the dissection must be carried upward and into the foramen so that the femoral vein can be seen both above and below. Often times branches come off directly at the foramen (3 1:2) (Fig. 4). U ually

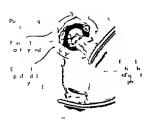


Fig. 4 G tsaph to ed th tamps both p xm I defined that have the inheary trucks apply the the that have the the tamper that have the tam

there are three branches in the last one half inch of the suphenous vein No 40 cotton is used for these heations. The presence of the small external pudendal artery is a good land mark as to the location of the foramen. The artery lies just below or above the saphenous vein at the level of the foramen and often may be double going both above and below. It should be levated if it is in the way.

The lemoral artery with its pul ation is located just external and can easily be injured with careless clamping of the artery lorcep. Often when the clamp or heature ships off the proximal vein stump profuse hemorrhage develop. In mot instances amputation followine, ligation has been the direct re ult of this injury from clamp or forceps with result ant thrombus formation and arternal blockage. This statement i made after autopsy in 2 cases and after careful study of case histonics from attending surgeons in several other cases.

A \n 16 cotton ligature is placed about the proximal stump lull and flu h 4 inh the wall of the femoral vin A second leature of \n 0 i6 cotton single is then tied about the same stump as a double precauti a against post

operative hemorrhaee. I have had this ere mence. Some prefer to tran fix the time that sall right. I prefer to use the two separate light causes and leave a lone er stumpe fix. In this way, there 1 no proturnal turple from which an embolus could come. A test there fourths to one inch is left did to the light cause the leature the elimination worry about the limitative slipping off the end.

A pursesting livature of No. 16 cetton a placed about the foramen (Fig. 5) on as to close the fat and fascia over it and this terinforce a weak spot in the fascial place out the lemoral vein the same as we would do with a femoral herma. Wost men do ret bother with this step hut I think it just good surgers to reinforce a weak pot mit deep fascia. It just lessons the pos bind a recurrence throu ha small branch that make left even with real care.

The distal stump of the vein 1 then picked up with small forceps A No 16 cotton had ture is placed about the vein distal to the clamp. With the forcep on the vein stump in one hand a cannula on a syrin e contains the clerosing solution is then slipped into the open end of the vein the clamp 1 remove?

and the ligature tied all at the same time The patient 1 then tipped into a marked Trendelenhure po ition and the foot and le are raised high for about a minute so a to drain all the blood from the varico-ed veins through the communicating seins into the deep system. The table and patient are then quickly tilted into the rere se Trendelenbur position with the leg still held hi h The leg is then quickly dropped to the table and two thirds of the solution 1 injected Since the varico ed veins are now empty and collapsed the solution will drain down and spread videly throu h the branches to the calf and at times to the ankle After 1 to 1 2 minutes the table is returned to about 10 de rees off the horizon tal and the rest of the solution 1 injected The wound is washed with normal saline to free it of any sclerosing solution that mi ht have been pilled during the injections. It is then closed with two sutures of \o 16 cotton and the skin with dermal Vlastasol helps keep the dressin, in place and furnishes a better protection

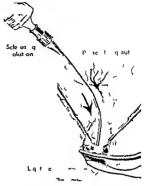
As son as the wound is dressed separate strips of adhesive are applied over the large segments of varices so that as the thrombus develops during the next 24 hours it will be kept as small as possible. A large thrombus will luyucfy and recanalize white a small one will organize with a good result.

Immediately following the operation the patient must walk rapidly the equivalent of one block. He can then dres and go home but must walk , minutes out of every hour a until 10 00 pm of the day of operation He is given some sort of sedative capsules for the moderate pain he will have and told to take them as needed and to report to the office . for a dressing a days later. That visit a very i important for his comfort. If the reaction through the thinh is severe the thigh should be strapped with elastic adhesive for support. If severe in the lower leg then a firm a meh bandage from the knee to and about the foot will give much relicf. I attent must continue to walk some every 3 to 4 hours during this

The sutures are removed at the end of a week and either then or at a later date the injections of the remaining patent varicosed segments are begun. If the reaction has been severe there is no harm to wait until it has sub ided. But it is very important that the follow up injections be continued until all the varies are firm and hard. Usually the injections are given every 1 or 2 weeks, and 3 to 6 at a time. These are of 1/2 to 4 cubic centimeter of the same selerosing solution. Immediately following each et of injections the patient mit it will fast 3 to 5 blocks and then at 6 requent intervals all day long.

#### TREGNANCY AND LIGHTION

The traitment of varicose veins during negating everyth in the is fated case does not seem ju tifiable. It times much richef can be given by a few mit closs. During pregnancy the mit closs of the feeder v in into a large and rapidly f rinning burst it is dispositional to ricky pun and t prevent the formation of the in whith condition—as condition that completely cleared once it fully divided. The ligation of the various veins luring jurgancy has been one hundred per



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cent failure and is not recommended. These patients should be treated palliatively with the injection as indicated and they should wear a firm 4 inch ace band ige during the day and remove it at night.

#### COMPLICATIONS

Complications are best divided into the e of the operation itself and those of the postoper ative period

The most common and serious complication that can and may develop during the operation is a hemorrhage. Hemorrhage may come from the tearing of a large dilated asceular than walled vun during the dissection it can best be avoided by not using forceps or clamy with teeth. Personally, I am very careful that no such instruments are ever on the table. Another common cause, of hemorrhage is the slipping of the forceps on the provincial stump during dissection or slipping of the ligature after it has been tied. The first

can bappen to any surpeon but the latter can be avoided if the care already discussed when the lightness are applied 1 exercised

If the proximal stump does become loose either from a poor forcep or a shoped heature where the vein is the size of the thumb the surgeon is faced with a real problem The patient is u ually nervous and strain They sense that something has gone wrong and they become more worned and tense. The blood boil up from the bottom of the wound as from a spring Here1 the poten tial source of calamity and the principal reason of a good operating room. The surgeon should keep calm and quickly place a large sponge in the wound with pressure and tip the table into a marked Trendelenburg posi tion Of cour e the shoulder supports have been applied as they always should be The leg is rai ed straight up and the table patient and leg are held in the position for minutes It is surprising to find that after that length of time the leg can be lowered to the table the pres are removed from the wound and there will be but little ble ding. The proximal stump 1 now carefully sponged and picked up and the operation continued \s soon as the stump has been reclamped the table may be leveled again

If a postoperative hemorrhage should devel op after the patient leaves the hospital I would in ist on his lying, quiet while someone quickly places a clean towel over the area and maintains constant severe pressure until the patient can be taken by amhukance to the hopital and operating table. It should be remembered that pressure and bandage will stop any hemorrhage. The wound should be reopened and cared for as described.

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I at let om tes hinher I dithiby da but the damp scomplit. The tiere tump ganigat did the pat into the extra part and the pat 
At time the femoral artery may lie anomal ously entirely in front of the vein for a inches down the thich If the patient i very apathe tic with a low blood pres ure and thinned walled arteries with poor pulsation a would be found in such a case it i po ible for the surgeon not exerci in proper care to li ate an anomalous profunda femori branch of the femoral artery. I am sure that the was what was done in one case with a resultant slou hol all the area of the lower les supplied by the branch The patient complained of severe pain through the leg and foot as the dital injection wa made under local and the is The operation was completed under gas ares thesia and the other side vas hated. The econd side progressed as usual while after a years of hospitalization and liti ation an amputation through the lower this h was mad of the first side

Gangrene of an extremity can happen only from a loss of the arternal supply. Gannete could not happen as a result of the retto rad injection at the time of the heatinn as the injection. I made into the returning side of the circulatory tree. The injected fluid could not get across into the arternal side by any conceivable route. It would seem that those who ago that it can do not reason out the route and direction of the blood flow in the arternal capillary, and venou portions of the circulation. A knowledge of the blood pies us reading to under the country of the blood pies us reading to the different areas would prove the fallacy of the did.

The greate i source of morbidity in this series as also with those patients seen after operation in consultation has been the sever chemical philebitis and the as octated cellular follow see the injections of too large amount of the sclero into solution. By the use of the titline technique described by the individual

izing of each case and by the injections of the smallest amount of the weakest sclerosing solution that will give a sufficient reaction to produce the obliteration of the varices this source of morbidity can be reduced to a manning.

The excessive phlebitis and painful reaction are best cared for by bed rest, with the application of hot packs applied widely over the area for 4 hours at a time with the patient getting up for a 5 minute walk twice daily The regimen will cause a rapid rehef of the pain and yet prevent the stasis thrombus extension and embolus formation attendant upon steady bed rest (6) I have een and have had cases in which the lower leg and even the entire thigh were swollen after operation This condition in my opinion was due to too much solution having been injected and to the patient not walking sufficiently to wash the sclerosing solution thoroughly from the deep veins after he left the operating room Thus the same finding would be found as in kep phlebitis Fortunately I have never seen a single ca e in which swelling persisted after treatment of the great saphenous and in only a cases after ligation and injection of the short saphenous

Any method of treatment for a certain conhiton is just as good as the results obtained. Time did not permit the collection of followup data and staft ties on my entire series of cases. However a complete check was made on my first 1146 case, but the information was reported on only those cases as which hatton had been done 1 year or more previous. b) The data would be almost exactly the same if a complete check were made t day except that there would be a definite improvement in the results.

An discuss on of the end results and recurrence must take into con ideation the path of gy present in varicose tens. It is even tailly one of discheration or the result of damag and injury that may have been us tained wars before. If that proces and those factors whatever they may be are still active more varicose year are bound to keefop as im goed 1. The wards with it to the dentit 1 mid with the full expectation that nev cavities will be found and cared for just so cavities will be found and cared for just so

with variouse veins. We must realize that time takes its toll and that the vearly visit to the doctor will probably show new varicosities forming. Just as with the teeth, this may be a progression of the old process, not completely checked or it may be an entirely new condition. We do know that in the average case, one or two visits to the doctor a year will be sufficient to keep the varieose state well under control and to prevent a reformation of the extensive variousities present when the patient was first seen.

#### SUMMARY

This presentation is based on an experience gained in caring for 2.58 varicose vein highlions over a period of 12 years

Every method based on sound reasoning has been tred and conclusion has been reached that the high saphenofemoral ligation combined with either the immediate or subcombined with either the immediate or subcombined with either the immediate or subcombined with either the properties of a second results. For any case of varicose veins with a definite reverse flow high saphenofemoral ligation is by far and wide the method of choice.

#### CONVICTIO S CONFIRMED

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## REFERENCES

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## ABSORBABI E GI'LATIN SPONGE AND THROMBIN FOR HEMOSTASIS IN NI UROSURGERY

## Experimental and Clinical Observations

## CORB PILCHER M.D. FACS and W. F. MEACHAM M.D. N. sh. lle Te nes ce

∃HE introduction by Ingraham and Bailey (2 3 4) of fibrin foam pre pared from human blood as an ab sorbable medium for the application of human thrombin constituted an important advance in technical neurosurgery Pecently Correll and Wise have developed a foam like sponge whose essential ingredient is gelatin When dry this sponge can be cut into sheets or pledgets of any desired thickness and di mensions it absorbs liquids readily and its tensile strength and other physical properties make it easy to handle without fragmentation in either the dry or wet state. It has the additional advantage of being produced from a readily available substance by a simple and

inexpensive process
The use of this sponge as a hemostatic agent
in neutosurgery has been carefully investigated by Light and Frentice (6) in monkeys
they found that the gelatin sponge is readily
absorbable and that it has no significant toruc
or irritative effects. In these respects it was

comparable to fibrin foam

Subsequently Light (5) employed the gelatin ponge in conjunction with boxine thrombin in a sense of human neurosurgical operations. As a hemostatic agent the ponge proved quite satisfactory and no harmful effects of any kind were noted.

We have earned out experiments on dog in which the efficacy of gelatin ponge has been determined and its absorption and replacement have been studied histologically. In all experiments identical observations were made upon fibrin foam as a similar medium of al ready establish hed value and safety.

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Concomitantly gelatin sponge has been employed in a number of human neurosurgical operations by a group of neurosurgeons who have been kind enough to forward reports on these cases to us for analysis

#### EXPERIMENTAL OBSERVATIONS

Identical procedures were carried out on all dogs with routine neurosurgical technique Under intravenous nembutal anesthesia the superior longitudinal sinus was exposed and two incisions about 1 millimeter in length made in it A small pledget of fibrin foam saturated with human thrombin solution was placed upon one bleeding point covered with moist cotton suction applied for a few seconds and the foam gently held in position for a few more seconds The cotton was then removed and the foam left in place Upon the second bleed ing point a piece of gelatin sponge of the same ize saturated with human thrombin was placed in exactly the same manner wound was then closed in layers with inter runted silk sutures

In all instances there was immediate and complete cessation of bleeding when either the foam or gelatin sponge was employed. The two materials seemed equally sait factory in this regard. Because of its physical properties the gelatin sponge was easier to ent into the desired size and had les tendency to crumble.

The dogs recovered promptly and none showed evidence of toxic or anti-enic reaction

The animals were sacrificed in pairs at in terval of 2 day 4 days 1 week 2 weeks 4 weeks and 6 weeks after operation. The areas in which fosm and sponge had been applied were somewhat adherent to the overlying to such and the foam and ponge (or in longer experiments the fibrous tissue with which

they had been replaced) were firmly adherent

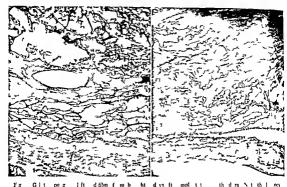
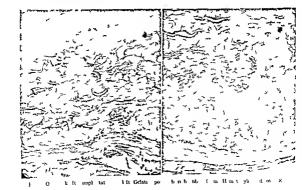
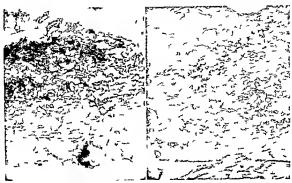
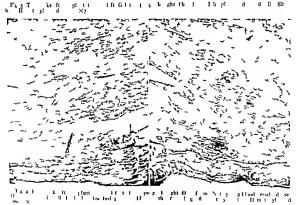
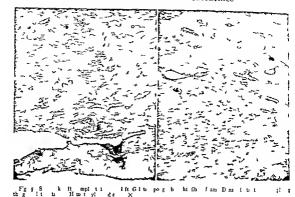


Fig. Git pog lift dábn í nobht dýs ít mpl tt. th dra \ t th l oy fit t fth fab fill dp. II m t vyl. d $\lambda\gamma$ 









to the underlying dura. The longitudinal sinus was found to be patent in all animals. The areas of dura upon which the spone and foam had been placed were removed fixed in 10 per cent formalin and sectioned for hit to

Microscopically the reaction to the two substances and their time of disappearance were quite similar. Comparable sections at the various intervals are shown in the accompanying photomicrographs.

lo\_ical study

There was an early infiltration of polymorphonuclear leaves to the spaces in the sponge or foam previously filled with fibrin (Fig. 1). Some times there developed a leucocytic mass between dura and foam with less infiltration into the foam itself as though the latter were relatively imperimeable to the cells (Fig. 2 b).

By the end of one week (Fig. ) infiltration of fibroblasts and round cells was replacing the early inflammatory change and this process was more pronounced at 2 weeks (Fig. 3) At the latter stage considerable absorption of both foam and spon e had taken place and new blood vessels were producing a phase of granulation

At 4 weeks both spon e and foam hal completely disappeared except for tmy us hated fragments which were surrounded by a mild inflammatory, reaction (F1 4) Young blood vessel were still present but the fibrout use was growing more dense At 6 necks the sites of implantation of foam and spon e were almost completely healed with the for matton of plaques of moderately dense elastic tissue (F1 5).

In general the reaction to these material was little if any more marked than would have been a sociated with the absorption of a simple hematoma of comparable size \ o si inficiant difference between the reactions to the foam and the spon e was detected

#### CLINICAL OBSERVATIONS

Reports on the use of gelatin sponge in a total of 272 neurosurgical operations have been received from Dr. Fdwin Boldrey. Dr.

THE VALUE OF GELATIN SPONGE AND HUMAN

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The reports have been submitted soon after the operative procedures and have presented the surgeons impressions of the value of gela tin pon constituted with a solution of thrombin as a homostate again. These cr in extensive correspondence no harmful late off ets have been reported and in our own allows none have been observed.

The poin, has proved mot useful in the control of cipidural veneus bleeding partie ularly under the bone edge adja int to an o to plastic flap of diffuse occuring in a tumor below repidural bleeding in the pinal anal and in the preparation of a line below to be for a

sutured peripheral nerve Arterial bleeding is seldom controlled unles in such a position that pre sure can be maintained

A summary of the reports received appears in the accompanying table. Every investigator has found the ponge to be satisfactors in the great majority of hi cases and has expressed a highly favorable opinion regarding its usefulness. In 3 of the 8 instances in which thas been riported unsatisfactors the in visitigator offered a reason not attributable to the shoppe to explain the poor result.

The opinions expressing greater satisfaction with gelatin sponge than with fibrin foam are based entirely not on the failure of the latter to effect hemo tasis but on the greater ease of handling the sponge. It has no tendence to crumble or fragment can be cut with a knife or serssors when either wet or dry and retains exceffent tensile strength when wet. In only 3 of 115 cases did the surgeon consider the sponge inferior to filtrin foam. It was considered superior in 70 cases but equally satisfactors in 42

#### CONCLUSIONS

In view of the observations of Light (5 of and of the results reported herein it seems justifiable to conclude that absorbable gelatin ponge is a safe and efficacious medium for the application of thrombin in the control of venous bleeding in neurosurgical operations. It usually easier to handle than fibrin foam and it can be produced in quantity by a simple process from a plentiful and inexpensive sub-tance.

## ENCISION OF THE FRACTURED PATELLA

ADOLPH A SCHMIER MD M 1 MC AUS T cloosa Alb m

LCAUSE of its prominent position at the anterior aspect of the knee the patella i vulnerable in direct as well as indirect injuries to the knee In direct injuries such as a fall on the flexed knee the patella is particularly prone to frac ture. In indirect injurie, such as a sudden violent contraction of the quadricep one of four types of defect may occur to cause a dis ruption of the extensor mechani m of the knee The patella may fracture the quadricep or patellar tendons may rupture or the tibial tuberel may become avulsed

Our particular consideration at present i with the fractured patella. Therapy in the other three instance 1 clear cut. Avulsed tibial tubercles are readily reduced and may be fixed in po ition by a screw Ruptures of the quadricep or patellar tendon require open operation for repair. The end results in all three of the emstances are usually good with out disabling sequelae

#### THERAPEUTIC PROCEDURES FOR FRACTURED PATELLAE

In the ca e of the fractured patella how ever therapeutic procedures are not uniform Many of the following have been used

Rest in bed with adhesive strapping to coapt the patellar fragment

Plaster-of Pari immobilization 3 Percutaneou circumferential wiring of

the patella with flexible stainles steel wire acting as a pursestring suture

4 Kirschner wires drilled percutaneously in rucial fashion through the patellar frag

ments to immobilize them

- Open reduction with suture of patellar frament and quadriceps tendinous expan stons Catgut silk linen fascia lata kan a roo tendon and wire have been employed as suture material
- 6 Open redu tion and fixation of the frame ments with nail screw or plate

From th \ rthi " Gen ral Ho-p 1 T -calonea 41

7 Bone graft in cases of nonunion 8 Partial exci ion with suture of the in volved quadriceps or patellar tendon to the

remaining fragment o Complete excr ion of the patella

The mere fact that so many types of treat ment have been employed an indication of the lack of satisfaction with any one of them

Disad antages of closed or open reduction Since the beginning of the oth century open reduction has been the method of choice in treating fractures of the patella vith will separation The incidence of nonunion and it brous union has been much greater with closed reduction than with the open method However even with the latter bony union i not alway obtained The result did in prove after particular care was taken to repair the lacerated quadricep expansion even then nonunion and fibrous union have been too frequent. The fact produces a sense of insecurity in the involved knee particularly when walking stair Some form of external support 1 often required to control this in ta bility Frequently in cases with fibrous union and even with bony union refracture occur whether treated ore mally by closed or open reduction It has been reported that to per cent of fractured patellae refracture. The recurrence may take place without actual trauma but merely following stron sudd n contraction of the quadriceps. The majorits occur within the fir t year but they may oc cur several years later A further complica tion: the malumon of fractured patellae. In many cases the patellar framents unite with some irregularity of the articular surface Ar thritic changes develop with painful restrict ed mobility and weak undependable knee At times it is necessary secondarily to remo t the wire suture or even the patella

E cision of the patella In view of the cort plicating sequelae noted which may fol > s open a well as closed attempts to obtain bons union exci ion of the patella ha becom 2 popula methol of therapy lartial or com plete excusor may be performed depending upon the local findings in each instance Total patellectomy is particularly indicated in se verely comminuted fractures comminuted fractures due to gunshot wound may be so badly shattered that nothing but total excision should be considered Usually the degree of comminution noted at operation is much greater than the roentgenograms in dicate These cases are more commonly seen in the service. In civilian life simple tran verse fractures of the patella comprise the large majority of cases Total patellectomy may even be preferable here originally when one con iders the possibility of developing nonunion or fibrous union union with second ary arthritic changes union with restricted mobility and refracture. In some cases the fragments unite with lengthening of the patel la which may restrict joint motion Preision of the patella is being employed in case of ar thritis involving the patella whether there has been a fracture or not

Ad antages of patellectoms. There are many advantages in the treatment of fractured pa tellae by excu ion Patellectomy offer a rapid progres ive uneventful recovery in practically all instance The fact holds true even in the compound cases provided strict adherence to the principles of therapy in such instances is followed The wound should be thoroughly debrided and cleansed. Following excision of the patella the joint capsule should be loosely closed with interrupted sutures. The remain ing wound i left open for secon lars of sure after clinical evidence indicates that there is no infection. With the use of sulfonamides or penicillin locally and parenterally the incidence of infection can be held to a minimum tatement 1 particularly true when the patella has been excised and ha thereby been removed a 15 urce of infection. Even in the occa ional ca e of infection complicating com pound fractures of the patella the proport for a well fun tioning mobile knee i bett r then patellectomy has been performed than when the patella ha la n permittel to r main

I toperative convale con efollowing jatel I tomy i much hirter than after open r lucii n I ati nts treate I I y clo ed or pen

reduction require plaster-of I aris immobiliza tion for approximately 4 to 6 weeks period of fixation will vary with the degree of injury and in open cases with the suture material used for repair I ollowing this an indefinite but usually long period of physical therapy and reconditioning is required to ob tain free motion of the knee and strong quad riceps power It may be 4 to 6 months before the c patients return to strenuous activity I ven then the knee may be symptomatic and refracture may occur Conversely in the healing of repaired fractures excessive regen erative changes may take place Calcium i laid down giving the appearance of an abnor mally large patella. In either case there is usually some loss of joint motion. Generally the patella is considered to have little osteo genetic property

Following patellectomy however the pa tient may be walking without dres ings or support at the end of 2 to 3 weeks. Motion and quadricens exercises can be instituted shortly after operation and a normally mobile and stable knee with complete function can be obtained within 6 to 8 weeks. I ehabilitation is progressive and rapid. In 2 of the cases to be reported in which the patella was fractured by gunshot wound the mi sile also damaged the articular surface of one of the femoral con dyles let there was no restriction of motion and no disability. One of these patients a paratrooper returned to jump duty Patel lectoms does not adversely affect motion strength or stability of the knee. In soldiers with unilateral patellar fractures and complicated femoral or tibial fractures of the opposite extremity exci ion of the patella per mits them early ambulation with weight by ar ing on the patellectomized extremity

lattal exc ion of the patella may be inch
cated in cases of comminution at either pole
of the bone. The small fragments are removed
and the patellar or quadricep tendon i su
turnd to and through the remaining large
fragment. Normally it is the lower pole of the
patella bata i comminuted and excised. This
ircumstance leaves a large portion of the pa
tella provimally to pretect the fumeral con
dyl s when kneeling. In these cases union of
the t individual structure all nei involved and

the required time of immobilization 1 again horter than when reduction is attempted Approximately 3 to 4 weeks 1 adequate

Disad antages of patellectoris receiveration of the batella Resection of the patella 1 said to have several disadvantages. One i that it removes the normal protection for the femoral condules Dobbie and Ryerson however ounte R Brooke of Lugland as statum that the patella is merely a morpholo, ical remnant phylogenically inherited and that it is tend ing to undergo reduction in size and to disan pear Brooke claims that it plays no func tional part and that in its absence the effi ciency of the knee joint is increased both in rapidity of movement and power \exerthe less following patellectoms the articular car tilage over the femoral condules and intercon dylar space anteriorly is left exposed to direct trauma Occasionally there may be pain when kneeling Regeneration of a new natella in kind however generally afford adequate protection

Dobbie and Riverson quote Cares Zeit and McGrath in their published findings relating to the receneration of the patella in dog Regeneration is said to occur under adequate mechanical conditions. The requires are a normally mobile joint following patellectomy and adequate repair of the soft parts. Evi dence of regeneration experimentally in do-s 1 said to appear roentgeno\_raphically in from 17 to 60 days. When adequate conditions do not prevail and the knee is not mobile due to toint tixation regeneration fails to take place In other word the actual exitence of a patel la 1 based upon the functional need of a ses amoid bone at the site of pressure and tension where the quadricens tendon \_lides over the femoral condules in a freely movable joint Thi observation appears to be sub tantiated by the cartilaginou and bone atrophy of the patella in case in which the mobility of the knee t lo t either by fusion or arthrodesis There i no record however of total and complete re generation of a new patella. In many cases actually there; no roentgenographic e idence of even partial reseneration of a new patella Let clinically one can palpate a tirm round or oval movable body thin the quadricep tendon at the ite of the old patella. Th

body may con 1 t of cartila e or fibrocartilare and therefore remain radiolucent. However it appears to function as well as a normal patella and afford adequate protection to the femoral condylar cartilare.

A second objection to the patellectom, I and to be the cosmetic chan I in the kree II I true that the prominence of the normal patella is lo I and even in case of patellar generation there I failure completely I recover the normal topography of the knee However this objection is in reinicant compared with the benefits derived from exci ion of the bone in properly selected case.

I third objection to patellectomy 1 said to be the diminution of pulley action which the patella normally produces during active extension of the knee. The patella doe carry the quadricen tendon away from the femoral condules and theoretically should increase the efficiency of the muscle by its le era e action However, one cannot disregard the excellently functioning powerful knees that are seen clini ally following excision of the natella The uniformly good results following patellec tomy fully justify the theoretically mathema tical diminution of leverage action of the quadricers. This statement is especially true when one considers the possible untoward sequelae that may result in attempting to obtain bons union of the patella Beside regeneration of the patella tend to minimize and re tore the theoretical lo of the levera e action

Inatomy In order fully to appreciate the operative technique consideration of the local anatoms may be in order. The quadri ceps femoris the great extensor of the le 1 ubdivided into four portions the rectu fem oris the vastus lateralis the vastu mediali and the vastus intermedius. All subdivi ion converge at the di tal end of the thi h ante norly to form the quadricep tendon which passes over the anterior surface of the patella and continues a the patellar tendon The quadricens tendon attaches to the base ante rior surface and lateral borders of the patel'a The patellar tendon insert into the tibial tu berosity In addition the quadric p tend n gives off an expan ion on either ide of the patella to form the medial and lateral patellar retinacula. These blend with the articular capsule and insert into the proximal end of the tibus on either side of the tuberosity. In fractures of the patella these expansion may be adely lacerated and it is important that they be thoroughly repaired. Thus it is een that the patella may be regarded as a sesamoid bone developed within the tendon of the ouadricips.

Optimum time of eperation The interval between injury and operation caries with the reperal condition of the patient. In compound is cture tharough debridement and patellectoms hould be performed a soon as it is safely no sible. The earlier the wound is chansed the le's tendency is there for it to tx come infected. In imple fractures allo there appears to be no advantage in operative delas. Il there i no similicant contramdica tion to immediate operation at should be ix formed directly after admit in n to the hos intal Hemorrhage can thereby be controlled thus avoning unn cossary edema an i multra tion of the soft to ues Some urecons hel his ever that when the off to ucsare moder atch traumatized immediate operation will further damage them and reonardize primary bealing They therefore prefer to ait about 1 seek lafore operating. The deel an pri marily a personal one but generally just ing operative delay offers no advantage

#### TECHNIQUE OF OPERATION

In compound gunshol ound tractures whether penetrating or perforatin the hould be ad quitely exposed in trund rder to permit thorough debridement. The ruth ir has had occa ion to treat perforating gun hot wound with compound trutums when the rountrenograms wer negative for freign bodies. The nound mentran can l sit it it mall yet expo une of them resealed hoe late it coloration of mu cle indicative if In such case it i imperstine that the becolored meet to to be exceed mee it may act a an eve llent medium i r th at the tanger to organism. John sme I In I m nt an I patell ctoms the joint cap ul h likix de locel with interrupted itum and the m und habith packed with trachn gauze Scoutlart I un an be

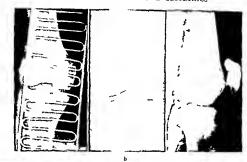


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e id ti san tifragme ts

performed in approximately t week provided there i no evidence of infection

In semble fractures either a vertical or trans ser a incision is employed centered over the natella. The former requires wide di section laterally of skinfa rial flaps in order to expose the quadricens expan ions. The latter an proach permits an easier exposure of the pa tellar retinacula. It i also preferable since it can be made a other the slan crease and there fore will heal with his tendency to thick carring which may prevent free flexion of the Ance Blood clot is removed and the natellar fragments excised can being taken to retain intact the quadricups tendon anti-nor to the patellar fragments. The fraved edges of the extensor tendon and its expan ions are then debrided and repaired Interrunted sutures are employed beginning at both ends of the rent in the expansions and working centrally to tendon. The pre educe makes closure much ta ser remaining wound is cloud in layer

Postoperate ceare it is preferable to immo three the knee with a poterior plint for a boodays. However a firm flannel or stocknette bandage may also be employed. The important factor i that acute flex in of the knee ke avoided until the regained tendon is well bealed. This brailing requires approximately sweet. In transitive immobilization is not objectional le in case of patellectoms. One





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of our patients remained in a plaster of Pair cast for 7 veeks during his evacuation to the zone of interior Vet he has a strong well functioning knee with a full an e of motion When the plint is removed at the end of the trist week, the patient may be encouraged to

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b rut hes f d g \text{ \text{ uppe} f k }
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begin flexing the knee gently. After the third eek complete flexion, hould be strived for Quadriceps setting exercises are all on tituted upon removal of the splint.

Wer ht bearing of the aid of a cane and po terior knee plint may be permitted at the



Logit 1 1f C 1 tb as ted the lat at ex-Fg 3 C e 6 b Logil 1 l ght pat !! D ber 5 043 f !! g f il from 044 1 8 1 4 944 ott ] p f th pal ll h wiefg Thige reg

end of a week. However full weight bearing without upport should be delived until the thirl week By the end of 6 to 8 weeks the 1 at ant should be at he to walk normally for a full lay on level ground as well as up and I vn tair One of our patients returned to parachut jump status at the end of a month ( mplete r hal ilitati n i generally of tained at the en lof 10t 1 weeks

#### END RESULTS

f total exci ion of the patella the nire ult are g nerally excellent. The 1a

1 Septe la 3

tient obtain a normally functioning knee with complete ran e of motion normal stability and powerful extension. They are able to walk long di tances and can manage stairs without difficulty. They are able to squat fully on both leg and arise with ease. They can ever quat partially on the involved extremity alone and area to the erect position vithout undue effort. One patient could quat com pletely and arise on the involved extremity alone kneeling may cause discomfort tem porarthy but u wally the sub-eles in time One of the cases to be reported levelope I an



Fg 4 Roe tg gram f rmalknee 1 So 3 90 d4 decrees deat peres met fith pa f th p t t fth fm ral ohlesd fl th kee

infection of the knee joint po toperatively, get he obtained a well functioning and almost completely movable knee. Had the patella remained. I doubt whether such a good result would have been obtained. In the presence of infection the patella u ually becomes fixed to the femur either partially or completely and thereby restricts mobility of the joint.

# CASE REPORTS

CASE I Pati t dm tted t St t H p t l Camp Mackall to the C 2 a Oct b 9 1943
f ll gagld rerash H ta d f t red
l t ftherght Ll mm t dfactu f th I ft pat lla af et f the p t borde f th I ft lat alt ble dl dl aton; t dtlt th left kne t l M keds ell g a tit in left kne t i vi ked's ell and eechym so of th ght kl dl ftk peent I e fth al fla loc l d ton of th patr nt d t f b th tes ne lyp stpo d The ht kle h o ntl d ced by th led m th d Op primd the little dth dtal t w ted fr m t f th pat Il d Th p t lla tendon t ed t th fra t d rfac f the p tell th f It carr d thr h t d ll hol th bo Thib that peet f th p t lt d m d th a frac pectifing the thing the arias ted face to the thing the ted face to the thing at the second the ted face the a of m t th kn dh ki lk m ht thus ppt Hwtb trat dtadt tpptrst trntit
Ptl tnfthptlladetd c th t wh h th at port t th h p tell em n t t

Cse Amddl d ma a tretdd e i aprate t \$50 hamile pil \( \) \( \) t i g \$1 t \\ \) t t t data e f t i thep II \( \) \( \) t p t t data e f t i thep II \( \) \( \) t t p t t data e f t i thep III \( \) \( \) t t p t b t data e f t i thep III \( \) \( \) t t p t b t data e f t i thep III \( \) \( \) t a me reduct d t f t t ted of dheq ad teep ep in the feature Flater iP rem b last as a pl t of abut 6 \( \) Whiph ith p a d t the pattigadult im it ham let t Cleall d t! the light p in the feature Flater ip pa de the feature Flater in the feature Flater in the feature fill white for feature in the feature fill white for feature in the feature fill the the feature

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nbtan fi 41 lth nt tpmtl
m than fi 41 lth nt tpmtl
m tf mth ltfm Fbrun 4 of
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bed d port lb th th hft 1
bed tham rith
be tham lift hft th th
t les t 1 hll j dth t ll f

me is again became widely separated. This a parat on occurred 3 months after the orig nal injury The following day the patellar fragments ere complitely excited and the tendons approximated and sutured There was no evidence of callus at operation

At pres nt the patient has a strong well funct on gright knee. He is abl to halance and squat par tially on the right lo er extremity alone and then re ume the erect positio. He is able to squat com pletely on both lower extremities w thout diff culty Mot on I the knee is complete and stab! ty is n rm 1 He is able to h n on the right loot without bucklog of the knee h celing n a hard surfac

causes mild d scomfort

CASE A Sold or was injured by shrapn I on May 16 1914 at Anzi Italy sustaining a compo nl comminuted fractu e f the left patella. At opera on May 17 the pat Ila 1 as found to be com m nuted more than the ro ntgenograms had a di cated it was the for e cased \ lage piece of shrapnel was f und in the infrapatella fat pad; the a ter r comp riment of the kn e joint. It had goug d ut an area : 5 ce timet rs : damet tf om th lateral f moral co dyle. The foreign body was removed and the edges of the a ticular defect smoothed. The joint was irrigated and o ooo units of penicil n instill d the it The symp a was clos In thinte rupted sutures and the remaind rof the wo ni gently packed with asel n gauge. The leg was immobil 2 d in pl ster. The pat ent was gi n 25000 u its f pe cill n i tr m sc la ly e ery 3 h urs fo a total of 825 000 units 1 100

Or My 27 as co dary cl sur f the wond ws perf rm! The quadreeps and; tellar t ndons wre coapt d and s t red a d the joit capsul cled. The rm der the wond was cised in layers. Pla ter-of P ti immobilization s em plo d The plaster r man ed o though ut the p to t sevacu t n t the e of int ri r It was rem el n July 14 7 we k aft r applicati that tim knee motion was poss ble only from 80 to 160 d g At pres th rang of m tini i m 150 t 40 d g es w th qu driceps power f 4 plu Stabl ty of the kn e s good a light nt is abl t

alkq t ill O pipaton nega sthe mp s that the seeg erati I a small p t lla fims lat ten balance hm II will on th m vol ed | g sq t partially an | r ume the ret post witho td ii culty With eight distributed n both f et he ca q at alm Le mpl tely He s

be gr dundfriet mt dut

C sr 5 1 rat cope was admitted to Stat on II sp t I Comp Mackall > rth Carol na on De ce b 1 1043 with p forati g 45 caliber bull t w nd thro h th r ht kne He sust 1 ed a com m nuted fra t e f th proximal th rd of the pat lla Reentg n grams I th k e als re ale i a d lect in th a t cular urf ce f the l t ral femoral e

Th entra ce and exit wounds were enlarged and debrided In addition to the comminution of the pa tella noted in the roentgenograms there was also noted at operation a complete longitudinal fracture The patella was excised in toto and the defect in the femoral condyle smoothed The joint was flushed with sodium sulfathiazole solution Plaster-of Paris immobilizate n was employed for z eek bout a week later the patient began to walk. He was last seen by me on February 29 1944 at which time he was back on full jump status. He had a complet raore of painless motion in the knee and his quad i cens power was exc llent Stab | tv of the knee was normal Patient was able t balance and squat com plet is on the a vol ed leg alone and return to the erect posit on without diffculty lie was able t walk stars with ease. His knee was function liv as

n rmal as before h s mury

Case 6 Soldier fell off a horse on Decemb r 15 ross while to New Lealand and sustained a long tu d nal fracture of the late al portio of the right pa t lla He was treated with bed rest and plaste of Pars immobilization fo 2 weeks ffe was then per mitted up with crutches and gradually walked ith ut support lle return d to duty but the pain 1 the knec inc ea ed Check up roentgenograms taken on April 15 1944 revealed nonuni n of the fractu e Accordingly in April 25 patellectomy as performed On May 4 1944 he began to run an elevated temperature and on May 23 the kne was 1 cise! and seropurulent material obt incd On July 19 th knee was ma toulated When exam n il by me on September 26 he pesented a farly good in c lie walked without a 1 mp and stabil to of the kne was normal He could balanc and quat p thally on the involved leg al ne returning to the erect posit n Th te was some re triction of motion which was po the from 18 to 115 d gr es Oua l ncep powerrated a splus On p loat none g ned th impression that an indefinitely outlined reg n er ted patella as pre nt R entgenograms s h stanti ted the progres e deposit n f calcium within the q ad cep and pat lla tendon

Ance joint infections without patellectoms usually result in a much more disabling and stiffer joint than this patient has The patella usually becomes fixed to the femur and causes marked restriction of motion Excision of the patella in this case has permitted a more freely movable and useful joint de pite the compli cating infection

### CONCLUSIONS

I The treatment of fractured patellae in the past by so many methods is indicative of dissatisfaction with all of them

2 When one considers the possibility of fi brous union or nonunion union with restricted mobility and instability and union with secondary arthritic changes one notes the hort comings of open as well as closed reduction of the natella

3 The hash incidence of refracture of the patella even following open reduction reveals the need for a more effective method of

4 Exci ion of the patella either partial or complete is the method of choice in fractures

3. Partial excision with removal of the small comminuted fragments alone is indicated only when a large uninvolved portion of the natella can be left in titu.

6 In all other instances of fracture total excision is preferable for the following reasons (a) Ranid progressive uneventful recovers usu

ally ensues (b) postoperative immobilization and convalescence are shortened (c) tree stable and freely movable here joints are greatly obtained (d) even when complication infections occur the prognosi is better when patelllectoms has been performed (e) exciss of the patella does not impair the efficiency of the Lace.

7 Regeneration in kind may occur following excision of the patella to protect the exposed femoral condules

# DEFERINCES

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# INACTIVATION OF PENICILLIN BY VARIOUS CRAM NEGATIVE BACTERIA

W A ALTEMPIER M D FACS Ci e nati Ohio

LTHOUGH the majority of infections seen by the surgeon are caused by the staphylococcus and the streptococ cus many are mixed infections pro duced by these and various other bacteria particularly the gram negative bacilli. In the treatment of established infections of surface wound and abscesses pure staphylococcal or streptococcal infections have responded much more rapidly and completely to general or top ical punicillin therapy than did mixed infections. The course of many of the mixed infec tions seemed to be completely unaffected by expecilin and even the staphylococci and streptococci remained present in large num bers in the exudates. This fact suggested that the penicillin was being inactivated or de stroyed in the injected area probably by the action of the various gram negative bacteria To explain these differences of response to peniculin therapy a study was undertaken to measure (1) the effect of penicillin on the growth of the gram negative bacilli frequently found in infected wounds and (2) the effect of various gram negative bacilli on the activity of peniculin

It is well known that penicilin is a labile substance which is destroyed by heat prolonged exposure to the air and ordizing our ordining agents. In addition Abraham and Chain have found that extracts of Escherichia tooli prepared by cruding a suspension of the organi, mis in a bacterial crushing mill destroyed the bacteriostici property of penicilin. They believed the active to brace in these extracts to be an enzy me because it was not dialy zable through a cellophane membrane and because it was mactivated by heating at 90 degrees C for 5 munities or incubation with pripain

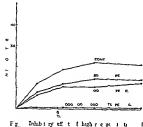
Iron h Department of currery Colleg f Med of the large of

#### METHODS

The gram negative bacteria commonly found in infected wounds burns or deeper abscesses are Escherichia coli Bacillus pio ocyaneus. Aerobacter aerogenes. Bacillus protess and Bacillus alkingenes fecalis. Representative strains of each of these bacteria were obtained from infected wounds and cultures of each in broth were used throughout the experiments.

In the first group of experiments are serior of culture tubes of broth media containing various concentrations of sodium penicillin from 0 oo 3, to 5000 units per cubic centimeter were prepared. Five of the series were then inoculated with 0 1 cubic centimeter of an 18 hour culture of one of the various gram negative bacteria and the sixth with 0 1 cubic centimeter of an 18 hour culture of a susceptible strain of hemolytic Staphylococ cus aureus which was used as a control. Mer 4 8 12 16 and 20 bour periods of incubation the effect of penicillin on the rate and amount of growth was determined with the aid of a turbidimeter.

In the second group of experiments the effect of the various gram negative bacilli on penicillin was studied in vitro. Tubes of broth media containing 20 units of penicillin per cubic centimeter where inoculated with o r cubic centimeter of an 18 hour culture of one of the gram negative bacilli and incubated at 4 8 12 16 and 20 hours respectively Another tube containing an equal number of units of penicillin per cubic centimeter was used as a control and incubated for 20 hours without bacterial inoculation. After the vari ous periods of incubation the cultures were passed through a Berkefeld filter to remove the bacille. The antibacterial activity of the bacterial free filtrates was then measured for the hemolytic Staphylococcus aureus by de termining the greatest dilution at which growth was inhibited



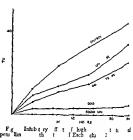
pencillin n tra fE h nch e h

Effect of pentallin on the rate and amount of grant hof gram negative bacili: When mocula tions of Escherichia coli Bacillus pyocyaneus Aerobacter aerogenes Bacillus ptoteus and Bacillus alkaigenes fecals were made into five series of culture tubes contaming concentrations of pentallin from 0 cop to 0 units per cubic centimeter of beef infusion broth the effect of pentallin fater incubation for 18 hours is shown in Table I Little or no inhib tory action on the growth of Escherichia

TABLE I —EFFECT OF PENICULLIN AFTER
INCUBATION FOR 18 HOURS

INCODATION TO HOUSE						
Co	E Coli	в Руо- суза ш	A. A ro-	B F o	B Alka- lg ea fec l	Staph ureus (Co not)
000	++++	++++	++++	++++	-	===
000	++++	++++	++++	++++	Ξ	=
5 000	++++	++++	++++	++++		
	++++	++++	++++	++++		
5	++++	++++	++++	++++	=	
6	++++	++++	++++	++++	=	
	++++	++++	++++	++++	~	
56	++++	++++	++++	++++	_~_	_=_
8	++++	++++	++++	++++	-	_=_
2	++++	++++	++++	++++	+	++
	++++	++++	++++	++++	+++	++++
	++++					
	-A 6 -L 1					

Sh wing lack figh by you five co en ra as fpening the th fiven us grang we back usin bemoly 5 h



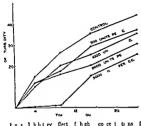
coli Bacillus picciyaneus Aerobacter aeo genes and Bacillus proteus occurred On the other hand Bacillus alkaligenes fecalis was al most completely inhibited by 0 of9 units of penicullun per cubic centimeter. Further size ies on four other strains of Bacillus alkali enes fecalis have shown all to be sensitive to the action of penicullin. The sensitivity of the hemolytic Staphylococcus aureus was used as a control for the purpose of testing the activity of penicullin.

If higher concentrations of penicillin were used such as 50 100 250 500 1000 2000 and 5000 units per cubic centimeter of media a definite inhibitory effect on the rate and amount of growth of Escherichia coli was ap parent If the amount of growth was measured in units of turbidity on the turbidimeter at intervals of a hours it was found that the in hibitory action increased with the concentra tions of penicillin This fact is shown graphi cally in Figures 1 and 2. The degree of inhibi tion varied with the strain of Escherichia coli in Figure 1 it will be noted that growth was completely inhibited by 1000 units per cubic centimeter and in Figure 2 by 5000 units per cubic centimeter

The inhibitory effect was of a bacteriostatic nature since subcultures were always positive.

A similar but less marked inhibition was

caused by he her concentrations of penicillin nn the growth of Aerobacter acrogenes (Fig 3)



Fg 3 Ibbtry ffect f hgh cocel tras penicil trai fA b t ogenes

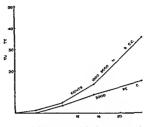
On the other hand many of the strains of Bacillus pyocy-neus tested showed marked resistance to concentrations of penicilin as high as 5000 units per cubic centimeter (Fig. 4)

The effect of gram negative bacilli on penicillin. Mer tubes of borth media containing rounits of penicillin per cubic centuracter were inoculated with Escherichia coli incubated for 4 8 1 of and 20 hours and then passed through a Berkfeld differtoremove the bacilli the antibacterial activity of the filtrate for the

TABLE II —SHOWING THE DESTRUCTIVE ACTION
OF CULTURES OF ESCHERICHIA COLI ON
PPNICILLIN
D t of bau the cull by

			-			
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	`		+	++++	++++	-
			++	++++	++++	-
			++	++++	++++	_
		+	+++	++++	++++	
		++	++++	++++	++++	-
	+				++++	
- 1	+++	++++	++++	++++	++++	
-	++++	++++	++++	++++	++++	
	++++	++++	++++	++++	++++	++
	1 +++	++++	+++4	++++	++++	++++
	l loss C					

that rial live (I es on ag pe I af Incube on with



Fg 4 M k d es sta f B llus pyocya e s t bigh r conc t ti f penicilli

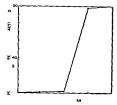
hemolytic Staphylococcus aureus was meas ured by determining the greatest dilution at which bacterial growth was inhibited. It was found that the penicilim activity had been progressively destroyed after 4 8 and 12 hours growth of the colon bacilli. The destruction was practically complete at 12 hours. The control retained its marked antibac ternal action for the hemolytic Staphylococcus aureusafter 20 hours incubation and filtration.

The same experiment was repeated with Bacillus pyocyaneus and a similar progressive

TABLE III —SHOWING DESTRUCTIVE ACTION OF CULTURES OF BACILLUS PLOCLANEUS ON PENICILLIN

D t	[ cuba	u wth	B 11 sp	yocya eu	h urs
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			+	++	*-
		-	++	+++	-
	<u> </u>	+	+++	+++	
	+	++	+++	+++	-
1	++	+++	++++	++++	-
-6	++	+++	++++	++++	-
	+++		++++		
s	++++		++++	++++	-
_ 5	++++		++++		+++
	++++	++++	++++	++++	++++

Bart at free it rates con aming pencilin al incube to will be improvement



Fg 5 P tag d t I pemeillan mata ta 1 u lygr gc lt es i B cili pyocy

destruction of penicillin was noted (Table

When the percentage and rate of pencillin mactivation were charted it was noted that approximately 98 per cent of the pencillin was destroyed within 12 hours and almost all of this during the 8 to 12 hour period by Escherichia coli and Bacillus pyocyaneus (Fig. 5)

Aerohacter aerogenes produced a similar but lesser degree of penicillin inhibition (Table IV)

(1801: 1V)

On the other hand Bacillus proteus had but little destructive effect on the activity of penicillin (Table V)

TABLE IV —SHOWING EFFECT OF CULTURES

OF ALKOBACIER ALKOGENES ON PENICHER							
Durati f cubati with A b t es h es							
D1 tions Amoun		8			Con ret		
				-	-		
			-	-			
		-	-	+			
.8		-	+	++	-		
- 6	_	+	++	++			
	++	++	++	++++			
-6	++	+++	++++	++++			
3	+++	++++	++++	++++	EE.		
	++++	++++	++++	++++	L =		
	++++	++++	++++	++++	+++		
	++++	++++	++++	++++	++++		

Bac real fre filtra es co taining penicilin afte cub too with

When a 24 hour culture of Escherchia coligrown in the absence of penicilin was passed through a filter the bacterial free filtrate different and contain a substance which matchated penicilin. At the end of 4 and 16 hours ince bation with penicilin no significant loss of antibacterial activity for the hemolytic Staph ylococcus aureus was noted. Likewise no significant destruction of penicilin was produced by the action of heat killed cultures of Escherchia coli.

### ANALYSIS OF STUDY

Escherichia coli Bacillus pyocyaneus Aero bacter aerogenes and Bacillus proteus are fre quently found in infected wounds and burns in association with staphylococci and other bacteria They are completely rest tant to the action of 20 units of penicillin per cubic centimeter a concentration greater than any produced in the blood and tissues by parenteral administration High concentrations of 50 100 250 500 1000 2000 and 2000 units have a definite but incomplete inhibitory effect on the rate and amount of growth of many of these bacteria although the effect varies in degree with different strains of the same organ ism. The action is bacteriostatic since the in hibited bacilli grow profusely on subcultiva tion in penicillin free media. Five strains of Bacillus alkaligenes fecalis on the other hand were very sensitive to the action of penicillan

TABLE 1 -SHOWING EFFECT OF CULTURES OF

Durati	f cub	t wt	P L	hou	
Dil tons Amous		ż		6	Co rol
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			( <u> </u>		
-4	-	-		-	<u> </u>
.8	-	-	·		
	-	-			
	-				
6	-	_			<u></u>
	+	++	++	++_	
5	+	++++	++++	+++	
	+++	++++	++++	++++	+++
	++++	++++	++++	++++	+++

These studies explain at least in part the frequent failure of penicillin therapy in mixed infections of wounds.

To overcome the destructive effect on penicillin produced by the gram negative bacteria these experiments suggest several principles in the local therapy of infected wounds

r The removal of as many bacteria from the wounds as possible immediately preceding the topical application of pennellin. The mechanical removal of devitalized tissue and purieting exade by measion and drainage aspirations or irrigation greatly reduces the number of gram negative bacteria at the time of the topical application of pennellin. Devitalized tissue invites and harbors gram negative bacility in the deviation of the topical application of pennellin. Devitalized tissue invites and harbors gram negative bacility infection and its removal by mechanical or chemical means would seem to be particularly important.

2 The local application of higher concentrations of penicillin up to 1000 or 2000 units per cubic centimeter to inhibit as much as possible the growth of the gram negative bacilli and their destructive action

3 Application of penicillin at frequent in tervals of 8 hours or less to compensate for the amount destroyed by the gram negative bacilli and to insure a level therapeutically effective for the penicilin sensitive bacteria also infecting the wound

#### CONCLUSIONS

1 Various gram negative bacilli commonly found in infected wounds were very resistant to the action of penicillin in concentrations up to 20 units per cubic centimeter. Higher concentrations up to 2000 to 5000 units per cubic centimeter produced a definite inhibitory effect on their rate and amount of growth. This effect was bacteriostatic in nature.

2 Bacillus alkaligenes fecalis however was

found to be very sensitive to peniallin

3 The activity of peniculin was progres swely destroyed by the growth of these bac teria particularly the Escherichia coli and Bacillus pyocyaneus in 4 8 and 12 hours The rate of destruction was greatest during the 8 to 12 hour period

4 The degree of inactivation not only varied with the different types of bacteria but also with different strains of the same type

5 The mechanical removal of devitalized tissue and purulent evidate followed by the topical application of higher concentrations of penicillin up to 1000 or 2000 units per cubic centimeter at frequent intervals of 8 hours or less is suggested in the local therapy of in fected wounds to minimize the gram negative bacterial mactivation of penicillin

REFERFACE A RAILE P dCial E Name 94 46 837

# IRREDUCIBLE INTUSSUSCEPTION IN INFANTS

# Report of Two Successful Primary Resections

LAURENCE S FALLIS M D F.A CS Detro t M ch ga and KENNETH W WARREN MD B sto M sachu ette

UCCESSFUL resection of the intestine for intussusception in infants under I year of age is rarely achieved Dond in 1913 collected 8 cases of successful resection of the intussuscepted bowel in infants below this age By 1921 Clubbe could find but 10 instances of intestinal resection performed for intussusception under i year in which survival occurred Wangen steen in 194 reported a recovery in a 4 months old infant following a stage resection by exteriorization and in the same communication he recorded the achievement by Den nis of a primary aseptic resection of the terminal ileum in an infant of 2 months Alberts successful case a new born infant reported in 1941 had a primary resection with an open anastomosis Recently we have had occasion to resect a portion of the bowel in 2 injusts with intussusception in which recovery ensued

CASE S R white fem 1 8 mo th of age a dmitt d to the H nry Ford Ho p tal Augu t 8 1943 with reg la ly recurr nt att ck fabd m al ele fohours d at on The pain was dden n n t and e t emely ere With each par xy m th b by wuld a ume an att t d of c teff on a d ers out go o ly Bet n tt cks th pati t uld sleep quetly and ppear pe f ctly no mal n e e respet The m ther had go e the nf t n en maad eeu ed thre mil blodel tonth e tuns The holbe no omit g Eam tin taled thit meer teplind sprt to bin mal Thipatitwa elld leed nd welln ur h dwhit f m l mf nt of 8 m nths alt r ntlyd bld p thp adl pigqitiv The skin was de nd cool The em nd r f the physical x min t n wa no mal cept to th ab d men which wa s ft and n t dist ad d Pan w s el c ted n deep pr s ur n the ght uppe nd right lower quad nts nd th baby t rued to the p one no ition and fl red h I gs when th abdomen was palpat d de ply As us g haped ma wa felt e From th Department f Surg ry Th Henry F d Hospital, D toot, Mich gan. D Warr n, 1 merly es dent 12 00, Th Henry F rd Hospital

peatedly in the ght s de about the level fith m bl us by som e am ners and n t tall b this Re tal am nati n e al ho realte adm vealed the persence of blo d and mucu on the earn g figr No mases culdbfltpe et Ope t n w s perform d 16 h urs fte adm The of ut wa a thet zel th pen d p the and the ant r r bd m nal all was i fit at d th pe cent no can solt ninth night ta its pln i tabo eth I I fth umbleu Thabd men a pen dthrough a trans erse e plotat a re e l da mass of t su e pted bo lin the egonof the tran r c lon Th d talpo t

than the abdom alca its The ms ng m sdelt e dthr ghth inc n nd theeth thesa was a r t dat this p int The lo eal po ton of the nt ssuscept; n as rd ced thmd rat ase but the entro t 1 mas as 1 re d cble Th in ol ed gment flum a r ett d with e d to-end a eptic a stomos This as closed in layers with it rupted fire ik E am nat on Ith pec me r lda i ki sd er t cul m n rth apex of th ntu susc pt

Cont u us gastres et o wa institut d dpr trlfludsielud blodplm m glucos a ds l e eg e fely Th alyport operate prod m a d id f nto rdied t anda o mal t ol was pas d n the fithdy T day late the bdomen'b cam dist d d To t m 8 deg e F nd th miant anper tu e r e to pea ed cut ly ll Alte a fe tr blesom d) th le dappear da dth patent m dr p dst ides twa dre er, Shw d harged Sept mber 2

943 Sub eq e te urs h she nun ntlui Case 2 CH > 300 56 15m th ldwht ma nf twa awake d t500 m n Virch 3 544 se am gwith abd mn i pan which prist de 3 m nute dth n 1 d ponta eo ly The pa ecurred at regula 1 terval nd merea, d te dly ty B twen pa ysms th baby r la dad we ttoslep Th p tent mit dt c a dpas d on st I whi he at in ds m blood cl ts Th t f nt was br ght t th hosp tal 6 hours lter the o set [ vmpt ms

Examinat nr elda well de i ped d ell ish dim le ni ni wh s skin w spi nd cool Temper t re was 98 d gr es F Th bdom wa s fta dro nded th nel g t d mass nth\_r upper q ad t b ath th cost I m rgin R ctal of bloody m cus e minato e aldth pres

The patent was gen ple ma and blood tran fu si ne immed ately and tak n t th operating room Open d pether an sthes was adm nist red and th abdominal wall was infiltrated with 1/4 per cent novocan of t n in the right trange etus plane i st ab , the le el f the umb leu The abd men was open dibr ughat ansvereince ion Theether ane thes: was 1 m nated at this time and the remainde of the pe at n was perf m d unde local anesth s a The apex of the intu se pti n had progressed f om the terminal ! um to the spl c fl zure of the n The d t l po to n of the intu su cept on r d cedwilhea ean fred et neontinueduninterrupt dly unt 1th 1 ocecal val e nas reached. The final stages I reduct n was difficult but was fin lb, ac complished with tundue trauma to the bowel. The terminalile in cecum and t rm nal port on fth as cend g colon were g ngren us Th ombosis of the ileocol c es la was ob erved The terminal 3 inche of the ileum the c cum and proximal 1 inch of the as cend ng col n w e r m ved and an open side to s de ana tomosis was d'ne between the sleum and a The 1 ci ion wa clo ed in layers with c ad age 1 interrupt d f e silk Postoperatively the pat ni was placed an oxygen tent and g en pa enteral flui is incl ding blood plasma gl cose nd line C ntin u gastrie suct on was m intained for a days. The clinical cours was relatively smooth un til the nth post pe t ve day when the tempe tur bec me el vat dt 102 degres r E min tion reveal imod rate as ction of th pharyax and ins c t on of the tympan in membrane bilaterally I ve cont n edat the level for 5 d yeard thene bed dwith utf rth a cident Normal b welacti th a cond d v after the perati its r turn d and oralf ed gs w r resum don the fithd ; Th pat nt was discharg d March 22 944 dh s pur elanunes tiule urse since that t me

The factors militating against the accomplishment of primary resection have seemed so numerous and so uncompromising that the procedure has been condemned by many surgions who because of their peculiar eyerence are qualified to speak authoritatively on the subject Unfortunately the alternatives to resection with immediate restoration of continuity of the bowel in the prevence of irreducibility and pangrene are associated with an equally forbidding mortality and are anatomically and ply sologically less plau tible

# FACTORS INFLLFNCING RECOVERS

Significant factors which influence the course of intestinal resections in infants may be divided conveniently into 3 phases

P coperative phase. In the preoperative per roof the curls recognition of the intu suscep

tion is of paramount importance. The clastical description of the disease is usually reproduced with such fidelity, that the diagnoss is rarely difficult. Delay on the part of the parents in bringing the infant to the physician accounts for the majority of late diagnoses but occasionally the apparent benignancy of the condition and failure to feel the abdominal mass will lead the surgeon into gneyous error

Once the diagnosis has been established surgery should be delayed no longer than is re oured to render adequate preoperative prep aration This preparation should compre hend the treatment of shock which is often present in some degree and the restoration of fluid and electrolyte halance Failure to ob serve this important aspect of preoperative therapy has in our opinion contributed in a real sense to the high mortality of intestinal resection in infants. The immediate adminis tration of plasma until properly typed blood is available should be employed routinely and the infusion should be continued throughout the operation This procedure if carried out with dispatch need not delay surgical intervention

A nasal catheter should be passed in order to maintain the stomach in a state of decompression during and subsequent to the operation. There can be little doubt that infants tolerate intubation poorly but we believe that the advantages outweigh the disadvantages even in patients of this age.

Operate e phase The important considerations bearing on the operative phase of treatment are numerous

The anesthetic of choice is open drop ether but the related factors of depth duration and supplemental agents deserve particular attention. Infants already suffering from shock submitting to a major surgical procedur, which involves considerable manipulation of the abdominal vicera tolerate deep and prolonged anesthetic very poorly. Consequently it has been our practice to administer light other anesthesis followed by liberal infiltration of the abdominal wall in the region of the proposed incision with a ½ per cent solution of noocain. The abdomen is opened and the portion of the hutussuception which can be reduced easily is manipulated intra abdominally

The diffuse form Chronic ulceration causes extensive thickening and fibrous of all layers of the bowel Multiple areas are affected with a predilection for the occum and sigmoid colon and alternate with segments of attenu ated intestinal wall Occasionally the whole length of the large intestine is thickened

The locals ed form is discu ed under ame\_

bic granuloma

The solutar, the nuc ulce mo t often occurs in the rectum. The size varies and may extend to several square inches. Evuberant vascular granulation tissue is found in the base, and the margins are thickened and edematou—appearances which may readily be mistaken for malignancy. The mucous membrane in the vicinity may be very edematous in the form of pseudo polyps. Chronic amelia ulcers may very occasionally become malignant (27). The fibrust streets. Boxes conserting that

The fibrous stricture Rogers considers that abrous stricture rarely follows amelia infec tion (35) but this 1 not the experience of other observers (12 24 30) According to Lynch When cicatrical deformity of the colon and extensive peritoneal fibrosi have resulted from prolonged or deep or extensive infection the damage is more or less perma nent even if the ameba is eradicated Stricture is probably the result of associated secondary infection for the Endamoeha histolytica induce little inflammatory reac tion of itself (12) It is often surprising to ce. at sigmoidoscopy how even advanced amehic ul ers of longstanding resolve with little or no scarring Applying the modern criteria for diagnosis including biopsy amebiasis is a rare cause of rectal stricture. It may be noted here that the identification of the Endamoeba hi tolytica in the tissues requires special experience and in this type of lesion may present difficulty even to the expert

Imbbe grandoma or ameboma. Prolonged infection under certain conditions as may occur in the delayed resolution of an acute infection gives rise to an infiammatory that ening which gradually becomes defined to form a discrete mass—in the case of amebic infection this is known as amebic grandoma or ameboma. The eccum is most often affected but ameboma may occur in the sigmoid and other parts of the colon. The omeatum is

usually adherent and the appendix run be included in the mass which may also involve the ascending colon and attain a considerable size. To the naked eye the condition may suggest the re ults of acute appendicuts diverticuliti or regional ileits. Chrone amehic ulceration occasionally produces a manalogou condition in which fibross predom nates. When a localized segment is affected carcinoma hypertrophictuberculosi ordiner ordiner.

ticulitis may be closely simulated (1, 18) Amebiasis of the appendix Amebic infec tion of the appendix arises by extension of the infection from the cecum and whenever the cecum is extensively affected the appendix is likely also to be involved. No t example sare subacute rather than acute. The incidence bas been determined at postmortem examina tion of patients who died from amelic disen tery In Clark's series of 186 postmortem examinations the appendix was involved in 41 per cent and o 2 per cent abscess or perio ration had occurred (8) His series i exceptional for only a small proportion of the patients had received emetine Crai found 16 examples in 60 necropsies and Stron reported 7 in a series of 100

The pathological chan es range from pin point ulcers confined to the murosa and sub mucosa to inflammatory reaction which includes the whole organ. In the more sever infections edema is a prominent feature the walls are thickened pus is found in the lumen and the serosa is congested and may be con ered with fibrin Similar changes are usually found in the cecum. Abscess and perforat on have been cited but clinical experience indicates that these complications are rare if emetine is employed 'Examination of the contents of the lumen usually discloses the Apart from the Endamoeba histolytica presence of the ameba neither macroscope nor microscopic appearances can be distiguished from those of nonamebic appendicitis Remarkably few examples are reported in the literature of the discovery of the Endamocha histolytica in the tissues of appendices re moved at operation even though they have been present in the lumen (14 18 24) b t they are often seen in postmortem specimens with coincident amebiasi of the cecum

The majority of appendicular lesions which develop during an attack of acute cecal amebiasis are of this type but of course nonamebic acute appendicitis may also occur

Following an attack of acute occal amebia is interval appendicectomy occasionally reveals gross changes in the form of constructions and adhesions and the appendix may contain pus with amebia. Evidence of chronic inflammation is often seen on micro scopic examination but how far the appearances can be attributed to the previous amebic infection is conjectural 4—

Local complications of intestinal amebiasis I erforation is frequently found at postmortem examination in fatal cases of intestinal amebiasis Strong reports 19 per cent, and Clark 10 7 1 F cent (8, 30) The commonest sites are the cecum si, moid appendix and rectum multiple perforations may take place As in other diseases the lesion may be acute subacute or chronic and either intraperitoneal or extrancritoneal Most perforations appear in association with fulminating attacks but the condition may arise in attacks of acute and chronic dysentery of any severity. In the retroperitorical variety, abscesses may form and track widely into the perirenal, sub phrenic, and pelvic spaces (10 24)

"Brief mention only will be made of other local complications Spontaneous hemorrhage of serious proportions is occasionally seen—3 of our patients required transfusion on this account Handling of the boxel at operation may be followed by dangerous hemorrhage from ambie\_tilers the eccum is particularly prone to this complication of

Intussusception is rare and no instance occurred in our series although examples were seen in Indian ho pitals during the same period. Spontaneous reduction may occur as in a case reported by Parry. Adhesions bands an I kinking of the low-lare common sequelae and an occasional cause of intestinal obstruction (,);

# CLINICAL ASPECTS AND DIAGNOSIS

The clinical manifestations are just as varied as the pathological Atypical forms are common and may so closely simulate almost any gastrointestinal disease acute or

chronic that it is important to give every consideration to amebiasis in the differential diagnosis when dealing with patients who have hived in endemic areas. In spite of modern treatment relapse is frequent sometimes after a fong interval of apparent good health and permanent cure should not be assumed

The clinical diagnosis must be supported by the recognition of the Endamoeba histolytica in the stools or in specimens from the walls of sinuses or obtained at sigmoidoscopy or in bumpsy material. In assessing the significance of the presence of the vegetative form of the Endamoeba histolytica the fact that amebi asis may occurst with other conditions should not be overlooked. Endamoeba histolytica cysts so often occur in the stools of individuals in whom there is no demonstrable sign of disease that of themselves they are of little diagnostic value.

A further check on the diagnosis is provided by observing the effects of treatment with emetine. If complete resolution is not on tained the diagnosis must be considered further to exclude a coexisting lesion. Very occasionally intestinal amehiasis is resistant to this drug—most often in examples of long standing infection or when emetine has been previously employed. The drug should he used with caution on account of its cumulative effect and the danger of torue action on the myocardium and nervous system (31 40). Used with due care its value as a control of diagnosis is very considerable.

In chronic attacks investigation of the stools is an important step in the diagnosis but in acute attacks when an urgent decision must be made this would involve too much delay—one or two negative stools are of no significance. Acute surgical conditions must be excluded and in the remainder a provi sional diagnosis is made on clinical grounds and subjected in due course to laboratory confirmation. Unless this is obtained before emettine is given the chance of discovering the ameba will probably be lost but in unusually severe attacks immediate treatment takes precedence and theaccuracy of the diagnossiss later made evident by the roponse to emetine

teute intestinal amediasis pe foration \s
previously noted the majority of perforations

occur during the course of an unisually severe attack of intestinal amebiasis, occasion ally a chronic ulcer perforates in a patient with few or no previous symptoms. It is un necessary to refer in any detail to the clinical features as they do not differ from those due to other perforations. Severe toxemia from the associated intestinal ameliasis may almost completely mask the clinical evidence of per foration and it is not a very uncommon experience for an unsuspected perforation to come to light at postmortem examination Arising from a subacute perforation an abs ce s may develop very insidiously and lead to difficulty in diagnosis especially when the history does not suggest intestinal ameliasis perirenal collections for example may be mis taken for typhoid malana emprema and henatitis (22)

The uncidence of clinical perforation is low Strong reported 3 examples in 200 cases. In our series of 450 cases there was only one perforation which followed exploratory oper ation in a patient who died from a fuliminating infection of the occum and ascending colon (see Case M. H. following). In the following roo cases perforations occurred 1 in the occum in a patient moribund from a diffuse intestinal amebiasis and the second in a very severe acute infection of the sigmoid which growed fatal desinte operation.

When perforation takes place in the course of fulninating attacks the bowel is usually so fruible that repair is problematical multiple perforations may be found and the to remain as often overwhelming the outlook even with surgical interference is very grave indeed. By contrast in chronic and relapsing amebiasis the condition of the bonel is much more favor able and if emetine is not delayed the prognosis approaches that of perforation due to causes [t ii 10].

Acute cecal amebiasis Although there are certain individual features acute cecal amebiasis may be accepted as representative of the localized acute forms of intestinal amebiasis which may affect any part of the lar, e intestine

When the infection is confined to the cecum the consequences differ from those of the ordinary diffuse form amelic disentery in many important respects (a) pain is referred to the umbilical region and not to the hypogastrium (b) the local signs and loral panaraconfined to the r<sub>1</sub>, brit lac fosa. (c) durintblood and mucus are less frequent and not affrequently absent and (d) in general it is more difficult to find the ameba in the stods. This particular difficulty must be recornized or the diagnosis may be overlooked assoc used in some of the published cases (is 21). Fortunately the response to emetine provides a convenient indication in su pected cases

For the clinical discussion 3 types of cae will be considered the fulninating the acute and the special variety the acute cical ame boma. All have certain features in common which are presented in Table I.

Fultunating attacks are uncommon the majority are severe from the start but they may arise as an evacerbation of an ordinary mild intestinal amebiasis. The onset is rapid and abdominal pain both midabdominal and their bit lower quadrant comiting piecus and tachy cardia are the prominent features although subject to some variation. Diarrhest may appear either early or late and it is followed by the passage of blood and mueus. The signs of local peritornits appear early and many patients fail to respond to medical treatment and succumb within a few days to the effects of grant-rece or perforation.

A surgical opinion may be required in the less typical strate. It he nose to less shoult be toreinis more prominent and the lost signs remain more localized in the early stage than in the case of perforation but of cours when perforation complicates this type of creal amebians the diagnosis becomes for indable. Appendicates can be evaluated by the toreinia the wide extent of the local signs in the early tages and the departure from 15 typical mode of onset and course (Table 1) If the diagnosis remains in doubt Isparotomy becomes obli a tory

The following case is presented as a faul,

M H aged greers dmttdnbgots dmx completing 1d crh thbloeds dmx cu ndgrpg gh pogast 1 for 4d ) Th as his first att k Hist imper tu wa og der et puls rat o k and pr t sy te s pe mit th was td hydrat da dth were olecalized spins in the abd mc The stools recalled an ind f

nt xult with blood but no amel acor cysts and a cult te was made

Mi 24 h rs s ere l'continu fin ti right iliacf a ith nause l continu pain sppc r Di rhea wa troublesome anih temper t re w s 100 deg es pul e rate 30 a l respiratory rat 22 per minut The tingue wa furr d'an l mark d'tende ne an l r g dity ere found n th painful area max mal at McBurney's point \ lump was I und a d the pso sandthighr tation tests and rect lexaminat on ere n gati To exclude pe f ration or appe dici

tis exploration was ad ised At pe tion local pe itonit s v th turbi i free fluid a dan ed mato sand c ngested c cum were disclosed. The appendix yas in a imilar state and f brin depos t was seen on both organs Perforatio and gangrene were excluded and the operat

concluded with the r moval of the appendix which was y ry s ollen thoughout and the cont nt we e mucopurul nt but the e was no perf ton

gangren o ulceration

The n t ly saw Ittle chang in his e nd t and he as still passing f equent loose blood sta ed stool app rently fr e from amebae. The culture f the early stool d d not e eal any path g n o gamism. Lat r h s cond ti n became inc eas ngly s rious. Alth ugh the dia rhea continued and the stools were f quently e amined it ws n t til August 15 that the Endamo ba b tolyt ca was f und a d then in large numbers. Em tine a g en to s pplem nt his ulf amid treatment b t w thout flect On August 18 his blood co t ho d red blood e lis-3 5 mill ns hemogl bin 90 per e t white blod cells 7000 Many deg ne at p l morphonuclear cells were present and some my locytes a d nucleat d red e lis A blood transf s n ws given but the patient dedo th nixt di

l'ostmortem e aminat on disclos d' plast e pe tonitis with widespre d ecent adhes ns I ee p was found ; the right iliac fos a and in th parac legutt rextend g pwa d't ward she k'd ney P was also se b hind th cee m Th append x st mp was o nd but a pe forano b d occurred in the poste for suff of the a rend g col Th cecu prese t lee eralp iches f gan g cr a i th wh i f the la g tests w ft and falle the sten nega gra fith muc s memi n a lam bic le at on Th cut i flam nat spoces tid radfo 1h ilcum

This patient was admitted before our lab orator, was opened and hi tological exami nations were not made. Commenting on the case in the light of subsequent experience of amebiasis the cecum was noted at operation to be much more affected than occurs in appendicitis and the possibility of amebiasis might have been confirmed by immediate examination of mears from the contents of the appendix. The large of several lays be

fore the endameba appeared in the stools is of interest-thi also occurred in several of the recorded cases. We would now advise the empirical use of emetine immediately after operation in this type of case rather than await a positive stool report. Involvement of the deum has been found in only about 5 per cent of fatal cases of intestinal amebiasis

The acute type of cecal amebiasis is much commoner than the type just described Con statutional disturbance is slight nausea and comiting unusual diarrhea rarely prominent and abdominal pain is not excessive local signs tend to be disproportionally well marked Complications are infrequent and a response to emetine is to be expected within 3 days Further details appear in Table I

Involvement of the appendix by extension from the cecum is probably of frequent occur rence as already noted in the remarks on pathology From the clinical point of view this extension is of little consequence because both cecal amebiasis and amebic appendicitis are essentially medical diseases clinically indistinguishable usually responsive to medi cal treatment and unsuitable for surgery unless complicated by abscess or perforation (12) Lyceptional attacks do not react to eme time as in the following example

A ] aged 24 years was admitted n S pteml r 9 942 suffering from dys ntery which had com m need 6 weeks p v sly in th form of a m ld da he later replaced by ery freq ent stools with blood a d mucu This was h first attack Wh n exam ned he compla ned of intermittent mains in both il c regions h t apart fr m tend ness ther no abnormal ty was f nd The stools contain d E damoeb hat lytica nd emet e a d carb a ne were gi n Although the diarrh a was r lie ed and th ameba d appeared ir m the stool inte mittent p na occurr d no in the umb heal and right thac r gions Th attacks took pl ce three or four t mes a day lasting! an hour or so at a time. The app tit w poor b t there was n n usea r som ting

The it cks er d sever to and will na ke l tendernes d I pedinth n htilacfossa andt a much less r deg e pers t d n the left s de o er the s gmoida d descend g colon The e was n rg d ty and n mas R peat distool xaminat n wer n gative nd tw s gmo loscopies al o howed n b rimal ty On Oct be 31 he had an att ck of r t) than befo e and perat gt at r  $d \times d$ 

Laparot my re caled n dmt us injet d append x with ft thick will a d the all cent

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# TABLE I -LLINICAL FEATURES OF ACUTE CECAL AMERIASIS AND DIAGNOSIS FROM ACUTE APPENDICITIS

Acut C cal Am biasis

Acut Appe digit Perou h tory

Oit p vi thaks f dys t ry C mm od p no Occasa lly thak oi? ppe d u p t por d mail ymptou — o zi abd mail the mif t ague t dyse t y Previ u hit ry l dyse t y dyse t y lith the mid di ribea r up u e l d appe dictus No prod ur l ympt u

Mybesuddn mm nlym egrad l las refir d S dd n. P Imot I ys f red prese te :

loc l u l p ese ti g ymptom h t tta k m y om symptom m th di rrh a ept ally r ttacks wth muting dife

P -Rf d

Middle man but also hypogit if ditle! Umbul I pgistne. Colicky hig free mily ted R by Unlify liky oc lly nd utantly rum gorit o Typenly chig Intenditent with pe of 1 pull up to the pes in gympt mo left P set u jumptone; bo & per nt fit is Ny hystope lite man bent

P -- Loc I Pr t nghtula fossaf un hest t f ttak f nuty fappe dax Appe ra un numeati fre erd of a mut ) yungi un T mot to be dah ef m th first pa t ye yocca llyth ti ) yungi un Wilker! Al cuus rd ti i du fun ted U thy need thest ted glate U ybe se

h of mode t tosity

B th bs to mid to ke but t b pet d y O both ge rally oc-u re tt cks

Danh

Appers lyin the list h specifitads. Cupit 1 Ocsun lly dirib s by dup be til ympt m Wippe s ft m dy yaptin With pel sheets blood dim mybe thally not s. Blood ad dwines l to t pas d Occass lly consupat II d tail i lso fiet d dirib m lik ly

Edmbhilstatl V gtati Edm b hitlytica llybt a Pesn (Edam eb hitlyti de tid ally tlod the peted am tift i mib ape dest

C III ald I b In malder its kenotably less model to the ty Model so fit mp to doubt model for low but floc lobys to see used got the transper fer that the country for transper for the transper for the sound plant to the company to the seed of the s

bstru tr I nder is and zdty

T dimes us ally mod rat my be te Typically T dires opears m um alir malp t differs might h fast my by att k 4500 and yet Local of these per direction of the total of the total might be down on mask thu k ed et m of the total might be down on mask thu k ed et m of the down of the total might be down on mally might be down of the total might be down on mally might be down of the total might be down on might be do diffuse nd ne mpl t ddor not mask thick ed ec m
oc asi nally rigid ty ll m k d

Palp bl mass Thickening focum pp t by diffesol tio Appears lat d slowly s bs des 1 rm absces

J solat Mypersit! usd blimaif min s

Sp c al signs Psoas sign thigh tate gn d hype esthess are Psoas gn thigh tate gn d cetal independs as g sign bound t d roess comm Rectal comman tamponitum of post in the profit of the direct means d R sang agn fit p ex t R as g sign bound t drivess commo Rectal

# TABLE I -CLINICAL FEATURES OF ACUTE CECAL ANEBIASIS AND DIAGNOSIS FROM ACUTE APPENDICITIS-Contra ed

Acut Cecal Amebia is

Acut App ndicitis

Leucocst I flamm try type fappe deat rise to mod t
l elsom h rs it set witrophil eased d propout tly tafet re f betru tipe deal
Le cocytoss the phil cess t be pected th Depe d se ty f ttack. Mod rat se with t ryse er ttack bita t c ooo+ to yoccu ta t I m bom | ght rise i th m re cute ph se The charges the blood count a team bl b t bacess wh preset fid sell firm t

M h f ympl ms Rem k hly co tat set d ; c fe ts com bjectt co d rab! Od ( ppeara f ympt lly first m nci gw th psi of Abel in I pa ef ed local u

vmpt m Effect f m! ¢ Nd.

Typ cally chilespose n 3 d ys b t Semond COY less oem tig dyse t ry Neg ti i ttack clinically fined t th cecum positie fiding bott pect.

e cum pr sent d a r ughened and in; cted surface The a no leefl d'and explorat on di clos d f rther path I gy On rem al the appendix con tan d mucop and the m cosa was v rv woll n and how d numero small area of hemorrhage and how d numero small area of nemorrange aith gh trauma f om handling had b n educ d to a m mum. The caliber of the lum n was mech re-luce i by the edema. Microscope e amn to of t nts sh d pus c lis red blood c ll and m s I i meba h tolytica Th h tol gor al d c ngesti n of th mall essel shall ulcer tin f the mucosa and in and h eath the mucos mas es i no granular leucocytes ad eos phi The eosin phi cell e mpri d about t/to of the tot I c lls obs rv d. Ath ugh struc tures b ar g a me resemblance t End moeba h tolyt ca er se 1 and bene th th mucosa

h mat 31 n ta Furth r met ea dearba one eeg en C al cence as n t nt cly atisf ctory n the th d the complain dofpain ribel r hehm f und to be mod thy larg d This att ck soon ub d d t t for bout 3 weeks he c implained of term it ni c licky pa's in the mid bdom n leq nt tool e amin t n a d furthe s gmo doscop sho d in rm its tt was s mpt ml when h a tfor con alesce c n D cember

their tlent ty as not establ h d wh m m r

s u cd

This appears to have been an example of amelic appendicitis even though the Enda mocha histolytica was not found in the actual tissues Although examinations of the stools and sigmoidoscopy repeatedly proved negative evidence of amebiasis of both cecum and appendix was found at operation

The third condition for discussion with acute cecal ameliasis is the acute cecal ame

boma which is occasionally found when re olution of an acute attack of cecal amebiasis is delayed and is more likely to develop if emetine is omitted. In the early stages ten derness and rigidity tend to obscure the mass later when the tenderness is less and the rigidity disappears it is more easily defined The temperature and pulse are little affected and even in the presence of a large mass which may involve the ascending colon the constitu tional disturbance is rarely severe. Exacer bations are not uncommon and are accomnamed by an increase in the local signs, and a moderate rise of temperature and pulse. A slight rise in the leucocyte count of the type noted in Table I is usual

However suggestive an abdominal mass may appear of appendicitis in patients who have lived in endemic areas before operation is advised investigation should be undertaken to exclude amebiasis. In our experience sig moidoscopy is not often helpful in this con dition and repeated examination of the stools quite commonly proves negative. The response to emetine is very much more constant but if this fails laparotoms will be required for diagnosis. The following case of amedoma presented some interesting features

In September 1942 D J aged 30 3 t cated with em tine grains and s li nami les fram difctonof mebe ndS ed ntry Ite was admitted to hospital o December 8 94 becau e ff rther har h Fndamoel a h tltc

was fo nd in the stools and emeting and ca has ne were given th complete rel ef of symptoms On January 6 ameb culc rs I ther ctum confirmed by v min ton of the d charge e e fou d t gmo d oscopy Qun xvl was g n both r lly and by th e tum b t Ithough th d rrh did not ecur a e tous d te or t on in his general condition set in for which dita led in estigation fall dit findaca se On February 6 he c mila ed f pan n the ecal rea and a mas was dic v red A surgical op n n was obtain d to xclude append cts The swelling was tender nd fix d and about the size of a closed fist but there was no 1g d ty He was al o slightly te d rin th I ft lac fos a and the e was a slight 15 in t mperat nd pule Others ise in esti cl d gbl od co nts wa negat e and the gnos famebom was ccepted

D rig the no twel the temp attre and pulse fa led to ettl and the e was no cha ge in his con d from c pt fo the appea ne of a m nor d g ce of rigidity ad some incr a cin the l mp On Febru ary r emet n wa csumed a neek l t a very ema kable reduct n had coursed in the mass altho gh d rihe w th blo d and amebae h d r turned Qu nox) 1 nd carbasone we e prescr hed and a grd limpro muting n alc dt n followed By the nd of February th e was n gn of c cal thickening During Ma ch he h d mo abd m nal pain g in with da thea nd amehae in th stool A haal cours of emetin carb s n and quinoryl was commenc d on Ma ch 8 ad when h was transfer ed t a othe hospital o April of r et ra hom his g a al condition was much imp o ed

Relapse after emetine even when supple mented with other drugs is not uncommon Emetine bismuth iodide was not available at the time and it was only after every con ider ation that the physicians prescribed emeline to the extent of a total of 41 grains Serious constitutional disturbance 1 unusual with ameboma and it is prohable that some other agent was responsible in this case

The diagnosis of acute cecal amebiasis from appendicitis More than 30 years ago Rogers (35) described cecal thickening in cases of amebic dysentery which simulated appendi citis and which he had seen mistaken by phy icians and surgeon and in which the appendix proved not to be involved surgeons have been interested in this problem and there 1 ample evidence to support the view that surgeons who work in tropical countries have found that they must be con stantly on their guard to avoid operation in cases of amelic dysentery under the diamosis of appendicitis (6 1 23) Even in temper

ate climates the same difficulty may are as was witnessed during the Chica o entirm of 1033-1934 when of I to cases of ametic dysentery 32 were diamnosed as appendicti and submitted to operation

In the remarks which follow no pecul reference will be made to amebic appendicits a this is merely an extension of the infertion from the cecum The immediate diamo not acute cecal amebiasis is essentially clinial and laboratory confirmation must come later As a general rule there is little difficults in diagnosi -especially when there is evilence of involvement of the more distal colon or hver When the disease 1 confined to the cecum the di tinction becomes finer and occasionally the di ease so closely simulates appendiciti that recognition i not possible by the chaical method at our di posal Surgeons necessarily meet a high proportion of the more difficult cases but on account of the special risks of operation on the amebic abdomen every effort should be made to armye at a diagnosis without resort to laparotomy al though the mu t be advised if there is senous doubt

The individual items of diagnosis are pre sented in Table I but a few general observa-

tions will be added

The manifestations of acute cecal amebia 1 are much less constant than those of appendi citis and even when there is considerable resemblance it is usually possible to recomme some e ential feature which cannot be inte grated into the typical pattern of appendicits On the other hand the unexpected irregular attack of appendicitis is in the tropics very hable to be mistaken for dysentery e peculis if the typical history is lacking. In the hi h retrocecal po ition with comparatively mild symptoms appendiciti may sug est amebiasis of the cecum or in the pelvic position with hypoga tric pain it may lead to a suspicion of disenters affecting the distal colon Acute appendicitis associated with diarrhea is of course a nell known trap

In distinguishing these conditions in which the clinical features may be so similar success often depend on details-detail of the previ ous history of any premonitory symptoms of the onset and progress of the attack and of

the individual signs and symptoms. Rayner's observation the old dictum quick in and quicker out has long since been obsolete always there is time to make a considered diagnosis as there is to do a careful and gentle operation. (34)1 even more applicable to the diagnosis of appendictis in the tropics than in temperate climates and in any case of sus pected at pendicti amebiasis must always be expluded.

The local signs of acute cecal amebiasis commonly appear earlier and are at first more diffuse than those of appendicitis but they are by no means constant and not infrequent to appear most suggestate of acute appendict its 'Common erroristo evaggerate the importance of the local plus sical signs while neglecting the general a pects of the case we have even many examples of amebiasis drignosed as appendicitis on this account. Tailure to appreciate that the onset of an attack of cecal amebiasis may be very abrupt and that diar rhea is frequently abe not during the first few days are other causes of misslagmosis.

As already noted the individual signs and symptoms in amebiasis are much less constant than those of acute appendients this inconstancy applies also to the order of their appearance. In acute appendientis everytions to the rule. First and all the time the pain next naives then tenderness and finally lever with leurocytosis are remarkably rare (p. 20) but inacute/eccal amebiasis no set order applies.

Occasionally acute abdominal rens develop during the course of an attack of amebie dys entery and center in the right iliac fossa. The differential diagnosis then includes (a) an exacerbation of cecal amebiasis with or with out extension to the appendix (b) nonamebic acute appendicitis and (c) perforation of an amebic ulcer The diagnosi of perforation will not be considered further. The evidence may be sufficient to enable a definite diagnosis to be made in the more severe attacks of non amebic appendicitie pc ially of the obstruc tive variety or at least to leave no doubt about the nece ity for exploration. More often it is onvincing and a frequent result of explor ation under these conditions has been the It covers of acute amebiasis of the cecum and at times also of the appendix but not a surgical

appendiciti (r ) In the clinically less severe attacks any bias should be in the direction of ameliasis

The indications for operation in the doubt case When the diagnosis remains in doubt two considerations must be weighed in the balance the dangers of postponing oper ation in acute appendicitis and the pecial risks of operation in intestinal amebiasis (The reader is referred to the section. Operations in Relation to Intestinal Amebiasis follows ) The danger of delay in appendicitis nceds no comment and examples of apparent Is mild attacks which at operation prove to be much more serious are by no means rare Nevertheless when ameliasis is the alterna tive diagnosis with the attendant risks from operation a conservative attitude may well be the safer policy if all the clinical evidence noints to a mild attack

If a severe attack of appendicitis cannot be excluded with reasonable certainty explora tion must be advised. For the obviously mild attack and the attack which appears to be settling down con ervative measures with emetine should be given a trial. When acute symptoms develop during an attack of amebic dysenters exploration is indicated if the attack is clinically severe but with less severe symptoms the bias should be against operation When there is a localized mass in the right that fossa whether the cause is amedoma or acute appendicitis there is no indication for immediate interference the attack should be treated conservatively with emetine Opera tion is required only if an abscess develops or if the mass persists when it becomes necessary to exclude such lesions as tuberculosis ileitis and carcinoma

In perspective Attention has been focused on acute excel amebias and its diagnosis from acute appendictis. Amebic infections may of course localize in other parts of the large intestine with effects analogous to those de scribed. The possibility of other important diseases which may present a imiliar clinical picture must not be overlooked. These include malaria hepatiti both amebic and in fective typhod cholecystitis ulcerative coli tis and some forms of bacillary dyentery all may give rise to acute abdominal symptoms.

which may concentrate in the lower right quadrant of the abdomen Their sahent fea tures are well known and will not be described

# CHRONIC INTESTINAL AMERIAGIS

Amebiasis and chronic appendicitis The high incidence of amehiasis among solders serving overeas and its tendency to persist for long period and to relapse make this subject exceptionally important. After the war postdy senteric abdominal disorders will undoubtedly appear frequently in general surgical practice. For purpose of discussion patients may be divided into two groups (a) those who bave lived in endemic areas but give no history of infection and (b) those who have hird intestinal amehiasis.

In the first group, the possibility of unsus nected intestinal ameliasis as a cause of the symptoms must not be overlooked. However suggestive the case may be of appendicular disease operation is not to be advised until amehiasis has been excluded hy adequate investigation. Chinical features which suggest amebiasis are a characteristic diffuse rather tender thickening of the cecum, a tender firm sigmoid colon, and tenderness or enlargement of the liver Tenderness and thickening is sometimes present over other parts of the colon Investigation will include frequently repeated examination of the stools sigmoid oscopy and x ray examination-this may reveal unsuspected disease in the colon If after complete investigation there is no evi dence of amebiasis operation will be advised on ordinary surgical principles

In the second group of patients symptoms are often too readily assumed to be the result of chronic inflammatory changes in the appendix cau ed by the attack of dysentery for which operation is necessary. It is important to remember that the patient having already had dysentery is liable to relapse or may have been reinfected and symptoms which are very suggestive of appendictits may be produced. In addition however the possibility of postdysenteric intestinal symptoms of nonappendicular origin must be considered. Such symptoms may be due to a neurosis or to functional disturbances of the bowel or to organic changes such as scaring and adhe

cions attributable to the previous dy enten Dyspensia anorexia abdominal discomfort irregularity of the bowels and pain and to derness in the right iliac fossa may be ten sug\_estive of appendicular disease but more often result from one of the other conditions Even if the appendix is at fault the lesion may be an amebic appendicitis which may well respond to medical treatment Victoria many patients given time recover spontage ously For nationts who fall into this group, if there is a history of recent diventery ober vation for some months is advisable before operation is resorted to and in all cases the question of a trial of emetine or other arrely cide should be considered by a physician

Banerii and Chopra recommend an interval operation for every case in which the anner dix appears to be acutely involved dumps the course of an attack of cecal amphasis. The state that patients are liable to subsement attacks of appendicitis either as a result of chronic inflammatory changes in the appen dix or a recurrence of amehic lesions in the appendix It is not unusual to find gross changes of the type noted in the section on pathology in appendices removed at interval operation but ne would recommend operation for amehic appendicitis only when every effort to cure the condition by medical measures has failed-unless of course some complication intervened. At present interval operation following acute cecal amehiasis is usually reserved for cases in which evidence of appen dicitis persists after apparent cure of the recal amehiasis There is need for further investi gation on this point because Banern and Chopra base their opinion on an extensive experience

Finally attention is directed to the unsate appendicectomy in endemic regions. Rogers disclosed that a considerable number of chronic dysentering patients were found by the find office to have had their appendices immoved without lasting benefit (36). If a repetition of this experience is to be avoided appendice tomy must be reserved for carefully selected patients.

Locals ed chronic amebic lessons of the cecum and colon. The diffuse form of amebic colitis

which may simulate chronic appendicitis cholecystitis and duodenal ulcers is well known but the localized lesion with solitary or multiple ulcers thickening of the bowel and often a palpable mass has received little attention in general surgery. It is a rare lesion and the counterpart of the ameboma which occurs in the acute state and like it is of surrical interest chiefly because it is so liable to be mistaken for a surgical condition Ocea sionally the disease causes an obstruction which requires operation Typical cases have been described in the literature (15 18 32 37 at) and the difficulties of diagnosis and the dangers attendant on operation in unsuspected cases are well described. These dangers were clearly revealed during the Chicago epidemic and no doubt the publicity which followed ensured their wider recognition. However the time has not yet arrived when a majority of surgeons would subscribe to Simon's expemence whereas the previous tendency was to overlook amehiasis and to diagnose carcinoma or tuberculosis now the tendency is in the apposite direction

The clinical features require no elaboration and will be referred to in general terms only in order to emphasize their close similarity to those of other granulomas and neoplasms of the lowel In all the effects depend on the portion of the intestine involved the extent of the ulceration and the degree of mechanical obstruction As is well known while in lesions of the loner part of the colon alternating diar rhea and constipation and the passage of blood and mucus are usual in the midcolon obstructive symptoms are likely to predom inate. In the proximal colon e pecially in the cecum a ma s of considerable size may devel op ilently as far as bowel symptoms are con cerned although reflex ga trointestinal symp toms may occur Palpation may reveal the presence of a mass and radiological evami nation will define its position and extent hi tory of previous dysentery would merely indicate the necessity of special investigation

It is generally agreed that radiological appearances are not pathognomonic of this condition. Deformities of the cecum due to contraction and induration such as a coned appearance have been described but they are

neither constant nor distinctive (27) Deform ity of the colon from ulceration or fibrosis may be marked but cannot be distinguished with certainty from other inflammatory or malignant conditions. Extensive deformity would support the diagnosis of amebiasis but Ikeda sopinion that the chief value of radiol ogy is the diagnosis of the site and extent of these lesions and as a control of treatment reprisents the limitations of the method

Differential diagnosis from carcinoma tu berculosis diverticultis and raret conditions such as regional ileitis actinomycosis and chronic bacillary lesions involves the accepted clinical radiological and laboratory invistigations and may provide conclusive evidence of one or other of these diseases. In this variety of amebiasis neither clinical nor radiological features are distinctive and diagnosis depends on the discovery of the amebia and

the diagnostic use of emetine

The detection of the Erdamocha histolytica in the stools may prove difficult and the greatest upportance is attached to the details to be observed in the selection of specimens for examination and the immediate examina tion of fresh specimens on several successive days (25) Sigmoidoscopy may succeed when the stool tests fail but as would be expected the percentage of positive results will be small when the proximal colon is affected. Finally emetine should always be employed for the diagnosis of tumors of the large intestine in patients who have lived in endemic areas whether the Endamoeba histolytica has been related or not. The effect should be assessed not only by clinical laboratory and radiolog ical examinations but also when applicable by igmoidoscopy Most amebic lesions re l spond conclusively but in some of the fibrous forms emetine has little effect. In view of the possible coexistence of other lesions if complete resolution is not obtained biopsy or

Excision then becomes necessary
Two cases will be described to illustrate
some of the points raised

M E an off cers wife ag das years was seen in con alt in as ano i patent on November 1992. The complained I pain in the right iluse for 2 off don frabo to months and of occasional mild I ver a dome loss of weight He appends had

b en emo ed when sh was 8 ve rs old a dat 27 she had am bic dysenters. She had recently be n invest gated in nothe hospital where a mass wa d sco ered in the cecal a ea The stools we neg and x ray showed n arr gul rity of the cecum and s m del y in empty ng of the ileum She had been ad 1. d to ha e a lap r tomy on the provision I d gnosi of tuberculos. On e mination there was found a slightly tende mass corresponding in size and postion with the cecum as sen in the x my p ct e n other abnorm I ty was noted. She was d t ha e lu the in estigat a befr s bm tt ng t operation b t while a a ting admiss n she developed anothe att ck of ameb c dysentery Six n Lal t after routine treatment he weight had in ased h abdominal symptoms were alm st c mplet ly rel ed and the en s no s gn of th pre lypeent n the right il c fossa

L H aged syears was admitted on February 13 944 with diar hea and vom it go fabot 12. h urs du at on He had siff edfir mite mit mit attacks of dir hea fit tulence and cole I r about 3 m uths and cons de abl loss of wight

Bacllary dys nt ry was at first su pected but si I namid sonly bought pat al cled f the da be a d the sto l c tunued t show blood and t mean in ammator, exudate but no mebae An Il d fin d m ss a f und in the nght hypoch n d in m bel w the l er F ut it rstool examinations r suit d n the d scov ry f Endamo ba hist lytte a the control of 
le d but the mas reman d unsificated. An x ay amination on Mar h 9 showed a con tant full ing delect f the ring type in the input h if the t answerse colon. Repeated e aminatin of the t is and sigmo doscopy produced no evid ce f amenta!

At ope at on a Ma ch 8 fo suspected carenom a a wder ct on of thet m nail um cenm a d colon was p flormed fo a tum r a th sate d cat d b x r y film Them oc licel nds w em de tel neilaged b t ther w s no sgn of b pat o the metast ses. The rem nung ds of th leum nd col nw eu u d to p o uite a col stomy

The pecim n p ent d a typeal execution tules limited including the b w l a d three m ll ulcres f the st coral type Scrap gs f m the ulcres f il dt show ameb e and mire cop ce mi nati nof the l ge leer how d col mina c ll d ac nm m with flammatry change s b 1 the glands Co l c uce was n venti l a d bw eks later the colost my w s excessf lly losed.

### AMERIASIS OF THE RECTUM AND ANAL CANAL

Amebiasi of the rectum and anal canal will be considered in two parts amebiasis in relation to simple conditions such as piles fissure fistula and fibrous stricture and amebic conditions simulating neoplasm

The piles both internal and external wh h so commonly accompany an attack of aredysentery usually resolve as the dysentery is brought under control althou h in exceptional cases operation is required at a later date Prolapse acts in a similar manner Pil se e to mild or chronic dysentery are of greater surgical importance for the dysenter, may be far from obvious and operation may be advised (17) Such cases are potential sure cal catastrophes and interference may be followed by an acute exacerbation of the dysentery -a most unwelcome sequel to a rectal operation-and by severe local complications and even by liver abscess McCo reports that 6 patients suffering from dysea tery during the Chicago epidemic were submitted to operation for piles one of whom died

In our experience in an endemic area amor, the patients referred to hospital for the treat ment of piles and fissures many were found to bave amebre dysentery or amebre protein. There was often no hit tory to suggest dyse tery and some patients had been cured of this condition in the past. Proctosopic examination alone is not sufficient and simmodoscopy and repeated stool examinations may be required to bring to high the less obvoist amebre infections. It is thou hit that post operative troubles such as ulceration and scarring which appear to be more hable to occur in the tropics than in temperate climatic are often caused by unsupereted disentery.

Among the less common complications of amebiasis are conditions such as fistula man anorectal abscess and pernanal ulceration. It is often not possible to find the amebia in the discharge but examination of scrapings from the walls of the cavity is more successful Bioppy may be used to establish the diagnoss although in most cases spectacular confirmation is provided by the response to emetiane

Jackman noted the low incidence of fistula and anorectal abscess in this disease and contrasted his figure of 17 per cent with the 39 per cent be found in cases of regional ileits and 84 per cent in ulcerative colitis. Two instances of fistula in anno occurred in our scries. Extensive persanal ulceration was commonplace before the introduction of modern treatment but its rarely seen today and on

that account the dugmous may be missed in chronic case. Submil described a remarkable example, in which wide pread amebic ulcer ation followed the rupture of an anal ab cess in a patient who gave no history of dy-entery the condition re ponded to emetine. One of our patients seriously ill with longstanding amebic dysentery developed an extensive perianal ulcertation with much overgrowth of granulation tissue which was very suggestive of condylomas in appearance. The Wasser mann reaction was negative, and the condition ultimately risolved completely without contraction on freatment with emetine, carba

sone quinoxyl and simple local applications The following cases are of relevant interest

JT sgcd 35 years was admitted for peration fer pulse no hierro of dy entery and part from a mas of introcticed in lest protect only showed no about part of marked the performed in the protect open showed no about part in was performed in per grees was a stactory nutli the eni fithe see nd week with the compile of of put the gainst his prochondrum. The peration a calwas almost healed but the lyr as ted and a remittent pyr without ig is fill d Plood counts she dis luce you consider the protection of the prochondrum of the protection of the protecti

g n th utclinical impowment Asp tin w ster de ishowed deg werted p c til and am nhu ddbrs Thepat twa graely lland lyingg n il and no Octoberió ndo perat w spe firmed into stage frs byh n b ces Latre m nat ns fikhed terger It din find

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This jatient was admitted before repeated examinations of the stools and sigmoidescopy were adopted as a routine preoperative measure in cases of piles although it may be noted that after operation and before emetine was given the stools were negative.

evertheless it seems probable that the

JID gd 91 is was admitt d n 1 gu to.
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I gres and enthmt hopital

On examinatin a apart fr m hir ctal cond the rwas found no brout caus for his high few r and to ema. The whit bill od en nt was 20.916 (not) m. phonul ars 78 per eent leucocy, test 21 per cent). On microscopic examination of the rectal discharge blood and pus were seen but no sign of am bae. An an sthetic was necessary to permit e am pation of the r ctum. Po tatte and per nectal because were c clud. Very sindamed piles were s n and the whole area within range of the proctor open was intensely c. gested. Smears were x ammed with the same result as b free

S Honamide treatment failed to reduce the tox mia and on August 13 a sgm doscopy was per formed. On account of the intense infection examination was restricted to the analizant and to per to of the rectum On that occasion smears talk in from the rect. I walls we e found it contain the Enda mocha histolytica. Emet e was rapidly effect; e a d, a forting the latter's gmoudose py e call direvidince from the minimum and the minimum

This exceptional case illustrates the grave danger which may attend even such a minor surgical procedure in the presence of an

amebic infection

Fibrous stricture. Contrary to earlier opin ton the view is now held that ame bic disease trey rarely produces fibrous stricture of the rectum. It is often impossible to determine the nature of the infection concerned for apart from conditions such as syphilis and lymphogranuloma stricture may follow many varieties of proctitis due to non pecific causes. Even when strictures result from amebic infections the identification of the amebia may present great difficulty.

The only example of fibrous stricture of the rectum which occurred in our series was

found in the following patient

W D aged 23 ye rs wh was admit d fr pr edd to there of Am the d ration on J by 1943. Mer t atment with emet cab and 23 lhe complianed of increasing difficulty in pa ghism t m H was fond to ha d whe six there after give here print of the anal can I and I wer part of the rect in which as clear linear and the six part of the rect in which as clear linear and the six part of the rect in which as clear fine the six part of the six

Biops) d closed non pec fie thr ne inflamm t ry ch ges only a d th Wa man r ct wa n gat \ c tain cau e s stablished to account f r the st icture

An ebu lessons of the rectum similating neoplasm. In intestinal amebiasis of long standing multiple polypoidal excrescences of granulation tissue or edematous mucosa escen at sigmoidoscopy, and may be mistaken for simple neoplasms. They usually disappear when emetine is used—if not biopsy will be required for diagnosis.

In recent years attention has been focused on the chronic amebic ulter or area of graou lation tissue which may assume the clinical appearances of carcinoma of the rectum (27 3 43) Typical amebic ulcers are occasionally seen at a higher level but in many cases the leston exists alone A short history extensive involvement of the rectal wall and absence of the typical induration of carcinoma are sugestive of ameliasis but frequent examples occur in which the clinical features cannot be distinguished from those of malignancy Differential diagnosis includes the discovery of the ameba in the stool or in crapings from the ulcerated surface but the possible coexist ence of carcinoma demands close observation of the effects of emetine and occasionally

This type of amebic lesion is to be expected from time to time among soldiers on their return home from endemic areas—the writer saw 6 examples during a period of 5 sears in India—and on that account 2 typical cases will be described

Du ng the withd walf om Burm H S aged

4 ye rs d eloped bdominal pain and darrh a
H nas dmitt d to a hosp t i n arn al in India th dirrh a had s b ded but n inflammators mas was f nd in the ght iliac fossa which persist dir me we l and appendix ab cess was d g o ed E ntually h a sent on le ve and appen dice t my a recommend dwh n he was ht While the pain and darrhear tred nd he was adm tt dt a other ho p tal The e the possib ht; f a pel cab cess was at first cons dered on account (a mod atef er and th passag I blood stan d m copus which did n t rev al ameb e When th ed a ma s in the rectum su gical peci li t disc ggest of carcinoms as cond which was rs n n was oht med

When seen nO tobr 5 942 he was still suffe ing from diarrhea with an intime it in blood stained discharge. Head is the trees in weight and high alunding a lindt near rylw Abd minal

ex minat on was negat e but on rectal examina a the lower edg of an indurat d mass w sfit r above the 1 ternal sphincte and abo t arregular ulcerated surface extended out I each ! the fing r b gmordoscops d sclosed an ul re occup ed the ante for ndl teral alls of the rect a betw en the th rd and fourth nches f om the Encroachment nth lum nr nd red the pas are of the instrum at diffi ult but the uppe peared normal B th to cln cal exam nati nande sigmo doscopy the co dition we sindist go hill f om ca cinoma Sc apings f om the ul er th blood and pus b t no amebae but as th r ass m del y before the spec mens were ex me d furth specimens were taken on the n at da a 1 im...e diat xaminat on disclos d considerabl n mbersol cti e E d moeb h st lytica

Te im ntwith meturew standbyeffer eight and strength in darshe was relieved a die gelt and strength in regaused. Repeated symo di copy confirm di chancal suppor ement and with a month it be tum had return di to normal. The part ent was di wield thave bus appendix remo ed at a lat di alth ugh it appea ed p obable that his appear aboves was in altiy an amebom. It feren

I L aged 2 years wa in hosp tal on to occa sions in th ye r 194 for amebe di ente y a i a h ttack respo ded to treatm at w th em tae ca baso e and q moxy! H w s readmitted o July 16 1943 for a recurrence and the E damoebs h stolyt ca was again found in the st ! Ch iof a and pot ss um bi muth todid (Indan eq al 1 ) the sto is continued lose they we egit it ambae on February 8 and 1 Sgm dose py ca F hru ry d clos d an ulcer with thick ed dg and an regular urfac c vered with blood and I me occupying but the fourth of the creum ference f the e tum a h rt d sta c bo th int rnal sph eter The ulce extended pw rd for b ut an inch and to p lp t and the nak dese might well ha e be m mal gu ut The h gh ri a hes f the bo t appeared n rmal Sc p ngs from th s rface of the ulcere ntained Endamoebahi t ht ca Em time was gien and dislat After 12 gra ns had bee annea d n th stool tkn they wr agann rm ! Rot et atm at was complited and tigmo does po n March to the ewas to gn of dise e the tha a sight te ency t bleed at the ste the lor had occup d On Mach o a furth r s gmo doscopy pere ted ahn rmality

#### A NOTE ON SIGMOIDOSCOPY

Apart from the obvious advantage in appropriate cases of obtaining a specimen for diag' nosis directly from the surface of an amebic ulcer or for histological examination sigmoid oscopy provides a valuable method of confirm

ing the effects of emetine when used for diag nostic or therapeutic purposes and for the exclusion of other lesions such as carcinoma

which may coexist with amebiasis
We have frequently found the Endamoeha

We nive frequently found the Education histolytica in specimens at sigmoidoscopy when the stools had proved repeatedly negative and have discovered still active ulcer ation when all other evidence indicated a complete cure from treatment Jackman advocates routine sigmoidoscopy for every cave in which amebiasis is suspected on the grounds that the occasional occustence of neoplasm i sufficiently frequent to warrant this step. The method is included as part of the routine investigation of amebic dysentery in British Multary Hospitals in the East

Various estimates have been given of the percentage of cases of intestinal amebiasis in which lessons may be found at sigmoidoscopy. Vanson Bahr reports at least 80 per cent while Jackman sigure is 20 8 per cent. The surgeon is more concerned with a selected group of cases in which the lesion is localized and on that account the method is most useful in rectal and sigmoid lesions. We have had positive results in about to per cent of attacks which on clinical examination appear to be confined to the eccum-

I or a description of the methods of preparation the sigmoidoscopic appearances of amebiasis and their differential diagnosis the reader is referred to publications by Manson Bahr and Biggam (a. 26, 27)

# OPFRATIONS IN RELATION TO INTESTINAL AMERIASIS

Operati is which involve disturbance to the bowel which has been infected by the I ndamoeba histolytica are hable to be followed by certain complications related to this infection. A brief summary is presented

tente exacerbation of amebic disenters. A localized amebia is may be transformed into a diffuse type occa ionally of great seventy. Mer intestinal suture and rectal operations the effects at the ite of operation may be serious.

Local and distant septic complications. These are common and may prove fatal Vlany examples appear in the literature of

conditions such as pericolic abscess gangrene of the bowel peritoritis and hepatic abscess in some of which the appearances at operation gave no cause for alarm

Intestinal hemorrhage Barry and Crump and Cope have emphasized the special risk of hemorrhage from amebic ulcers after oper ation most commonly in cases of cecal amehiasis

Delay or failure of the normal repair processes Prolonged delay in healing and spreading ulceration of the abdominal wall were often seen before the introduction of emetine and may occur to examples of unsuspected amebi

ass Failure at the subre line in cases of anastomosis figures prominently in the pub lished cases. Possibly the lack of round celled and fibroblastic reaction, which is found in certain circumstances in ameliae infections.

These dangers are well known and a sur geon's individual experience is therefore lim ited Three examples are described in this paper a case of fulminating cecal ameliasis and a rectal cases but other examples have occurred among surgeons of our acquaintance The most convincing evidence is presented in the reports of the Chicago condemic although it should be noted that the incidence of evere attacks was exceptionally high. In the early stages the number of deaths following opera tions for suspected surgical conditions as umed such proportions that the Public Health au thorsties found it necessary to take exceptional measures to advise doctors in the wide area concerned on the diagnosis and treatment of amebrasis () The mortality of the 1215 cases traced was 7 per cent McCoy reports 13 deaths among 32 patients submitted to appen dicectomy and other deaths after operation for cholecystitis and carcinoma of the colon In all these cases amebiasis had not been diag In 50 per cent of the fatal cases mis taken diagnoses were reported and in more than two-thirds of these the illne s had been handled as a surgical disease. In no instance did a fatality follow early consultation prompt diagnosis and pecific treatment (28)

In pite of these dangers exploratory operation is occasionally necessary as for example when the diagnosis between cecal and amel i asis and appendicitis remains in doubt. Simple exploration with no further procedure if amebiasis is found might appear ideal but certain disadvantages must be recognized. A mildly infected cecum may show no external evidence of amebiasis and there is a distinct possibility of treating such a case as an ordy nary appendicitis. Any manipulation of the cecum may lead to a flare up of the amebic infection but if appendicectomy is per formed the risks are much increased. In severe attacks the two diseases may present very similar appearances and it is sometimes impossible to distinguish them at operation Adequate exposure is necessary and the cecum may be adherent or the appendix diffi cult of access--conditions which may involve manipulation and predispo e to complications In the case of a occal amelioma, the appendix may be very adherent the tissues friable and bleeding may prove most troublesome-quite apart from the danger of bleeding into the cecum - and the removal of the appendix may be both difficult and dangerous

During operation handling of the cecum should be restricted as lar as possible amebiasis is recognized the appendix should not be removed unless it obviously constitutes a dan er When the appearances are inconclusive in the cecal area, typical changes may occasionally be seen in the more distal colon but if not appendicectomy is generally to be advi ed and the contents examined at once for the Ludamoeba hi tolytica

The fore\_oing ob ervations endorse the iew previously expressed when the indica tions for exploration in doubtful cases were di cussed that in endemic areas every effort should be made to arrive at a clinical diagnosis without resort to lanarotomy

In the past indications for operations such as appendicostomy and cecostomy were de scribed (10) for the treatment of intestinal amebiasis which remained uncontrolled by medical measures but today the majority of surgeons concur with Crain when he condemns their use With the exception of rare compli cations which bave not responded to the available drugs such as anorectal fistula colostomy is also madvisable. These opera tions are all hable to the complications de

scribed here and peritonitis is very liable to arise in the vicinity of the wound Fron when the disease is apparently confined to the distal colon it is not possible to exclude amebiasis in the more proximal bowel

The futility of colostoms for the control of active amebic injection in the distal colon is indicated by Manson Bahr's observation

When colostomy is undertaken in the preence of amehiasis on the mistaken impression that the symptoms are those of caremona the process of amebic ulceration is accentisted rather than retarded (27)

Appendicostoms and recostoms have here employed for the purpose of layage but the advantage over the rectal route is very ones tionable. Neither operation provides rest to the large intestine This object can be effect tively secured by ileostomy an operation which may have a limited application in se lected cases resistant to other treatment ( a)

To sum up excluding perforation abscess and obstruction there are few exceptions to the rule that operation is strongly contraind: cated in intestinal ameliasis. These include the removal of an amedoma which is is to respond to medical treatment, the provisi a of a colostomy for rare cases of intractable anorectal fistula and possibly the performance of ileostomy in selected resistant cases of intestinal amebiasis. Interval operation may be advisable after an attack of acute ce 1 amebiasis and exploration may be required in doubtful cases

Finally an important fact emerges from the study of the published cases—in a high proportion of those which ended fatally emetine was omitted or only commenced late after operation when the ameba was di covered in the stools According to Strong the curative action of emetine often stands in direct rela tion to its early employment in the attack (40) Operation may be necessary in known cases of amebiasis and in these the sooner emetine is given the better in reasonable doses any depressant effect on the heart is more than outwer, hed by the beneficial effect on the toxemia (6) When the diagnosis i in

<sup>4</sup> ribin ea ( an f b bubl hed ance as h failure to faccove th. E damocha hi. ) ica fee per son! to of repea of tool gamma ons al hough portin ent ex m. or erraled exten-acy inflictual and o size.

doubt if there is strong suspicion of this disease at operation it i unwise to delay its use until no iline cyidence i forthcoming

# SUMMARY AND CONCLUSIONS

Intestinal amediasis is the disease of major surgical importance in endemic areas. With the return of the forces from the East examples of this disease must be expected in

general practice at home

The clinical and radiological manifestations of the localized forms of intestinal amebiasis may be indistinguishable from those of surgical diseases acute or chronic. It is usually but not always possible to find the Endamoeba listolytica in the stools, signoidocopy may succeed when examination of the finish fails his response to emetine is of considerable diagnostic ignificance but occasionally the condition; resistant to the drug and exploration or bropsy is then required. The possible occasional or an existence of ametiasis with other lesions must not be overlooked.

Leforation of an amebic ulcer is to be expected in less than 3 per cent of cases. It is most often associated with fulminating infections. Lozenia may mask the clinical signs and if gangrene is present recovery even with

operation is very unlikely

The clinical features of sente eccal amebiasis and acute appendicitis have much in common the differential diagnosis may present great difficulty but in view of the special risks of operation in cases of eccal amebiasis every endeavor should be made to obtain a chinical diagno is If exploration proves necessify manipulation of the occum should be avoided as far as possible and unless the appendix is obviou ly in a dangerous condition it should not be removed if amebiasis is found emetime should be given at once after operation

However suggestive of acute appendicutis operation should not be advised in any case with an inflammatory mass until cecal amebia is has been excluded Amebic appendicutis is regard of for purpose of diagnosis and treat ment as an extension of cecal amebasis—until scomplicated by abscess or perforation it j a me lical disease

Un u pected intestinal amebiasi and post disenteric conditions of nonappen licular

origin often give rise to symptoms very sugges tive of chronic appendicitis. Before appendice ectiony is advised these conditions must be carefully excluded. Operation is occasionally required for residual appendicular disease following eccal ambinass.

Examples of localized chronic amebic coluts and ulceration of the fectium which may be mistaken for carcinoma or other surgical drease are common/in/endemic areas. Minor anorectal condutions such as piles fissure and fistula may result from unsuspected mild

or chronic amphiasis

With few exceptions abdominal or rectal operations are strongly contraindicated in patients suffering from intestinal amebiasis—they are often followed by serious complications peculiar to this disease. If operation is necessary, for if amebiasis is discovered at exploratory/operation the sooner crietine is commenced the better. Appendicostomy and eccostomy have no place in the treatment of this condition.

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# THE SURGICAL TREATMENT OF INJURIES OF THE BRAIN SPINAL CORD AND PERIPHERAL NERVES

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# CRANIOCEPEBRAL INJURIES

THE recognition of craniocerebral in junes presents no problem Evalua tion of the extent of the damage however is often difficult or impos sible during the first few hours after the in jury In closed head injuries intracranial hem orrhage 1 potentially present in every case In compound head injuries correct appraisal is usually impossible before x ray pictures of the skull have been taken the clinical course observed for a period of time or surgical exploration carried out Small lacerations of the scalp may be as ociated with extensive fissure fractures comminuted or depressed fractures of the skull or with erious intracranial bleed This is especially true in the case of penetrating wound which have been inflicted by small missiles

# INNEDIATE TREATMENT

The earliest possible removal of patients with craniocerebral injuries to a hospital where intracranial bleeding can be controlled and definitive intracranial surgery as needed can be performed as the basic principle in the immediate treatment of these injuries. Emergency treatment has for its ole purpose the preparation of the injured man for this evacu ation Specific methods of treatment for cere bral concussion and edema are all of question able therapeutic worth and need not be under taken If there are scalp wounds the hair should be cut for several inches about them with clippers or cissors but a razor should not be used at this time. Bleeding from open woun is of the scalp can usually be controlled by frm | r sure dressings Ligature of the larger arteries of the scalp is unsatisfactors and often impos ible due to retraction of these ve sels into the calp Troublesome bleeding from this source is best controlled by mattress utures about bleeding vessels. Wounds hould not be explored irrigated debrided or su

tured Sulfanilamide powder! should be dusted into all wounds in 5 gram quantities. Dressings of gauze should be large enough to cover the wound generously and should be firmly applied with a bandage which covers the entire head As long ast remains in place it should not be changed until the patient reaches the ho pital where definitive treat ment is to be given

Blood lost through external hemorrhage from the scalp if great should be replaced exactly as it is in wounds of other parts of the body. Bleeding from the ears should be treated simply by covering the external ear with a large loose gauze dressing. No effort should be made to stop this bleeding. The auditors canal should not be explored me chanically cleaned or irringated. Neither cost ton nor gauze should be introduced into the canal.

Shock is rarely the result of cranicocrebral injury. Its presence usually indicates bleed ing or trauma in other parts of the body. In these cases the head should not be placed lower than the trunk and the extremities since this position will aggravate intracranial bleed ing. Otherwise shock associated with cranicocrebral injuries should be treated without regard to the brain injury. Blood and plasma should be given as needed until the blood pressure levels approximate normal.

The unconscious patient should not be tran ported lying upon his back. In this position he may a p rate mucus and vomitus into his lungs and riav have his airway obstructed by the tongue Ife should be horizontal lying on his side his body rotated will forward his upper thigh flexed on the pelvis to hold him his head resting on a firm pillow or folded blanlet and turned toward the ground This position will prevent the longue

There are reported their rature has suit he tole not su adiast poled directle to the firm a product convolutions, but it practically perfect by b B inhight be the fast impairing has no continued there observed tions.

from falling back and interfering with respiratory exchange. It will also prevent aspiration of mucus and vomitus and will greatly reduce the hazard of aspiration pneumonia. In compound wounds the patient as a rule should lie only upon the uninjured side of the head. Conscious patients may have the head and shoulders elevated.

Morphine and other opium denvatives are contraindicated in ca es of severe cramocere bral injury because of their strong depressant action on the respiratory center of the brain The soporifies such as chloral hydrate nar aldebyde and amytal are contraindicated be cause their u e masks the significant changes in the patient's state of consciousness which are of prime importance in determining the presence of intracranial bleeding and the indications for operation Fortunately pain is rarely a serious problem in craniocerebral injuries closed or open unless they are complicated by senous injuries to other parts of When wounds of the thorax abdo the body men or extremities do cause great pain the first considerations should always be to relieve the pain but to use the smallest amount of morphine which will effectively accomplish this

Restlessness pre-ents serious problems in the care of cranio erebral injuries especially during transportation and if violent may result in serious harm to the patient. Sodium luminal , to 5 grains (0 2 to 0 3 gm ) given hypodermically is the best drug to allay rest lessnes in that it will quiet the patient with out depressing the respiratory center or greatly disturbing his state of consciousness. Sodium bromide or the triple bromides 15 to 30 grains (1 to 2 gm ) by mouth or 45 to 60 grains (3 to 4 gm ) p r rectum are also of value If neither of these drug is available morphine may be given in small doses & to 1/6 grain (0 000 to 0 010 gm ) and repeated after 30 nunutes if necessary provided the respiratory rate remains above 16 per minute

One thousand to 1500 cubic centimeters of bind each 24 hours should be given to all patients and if the patient is uncons 1005 or 15 comiting this should be given either by means of the rectal drip or by slow intravenous administration. The first doctor to treat the patient with a sense that the patient part of the following facts without fail (i) time of many as mearly as can be determined () tate of consciousness—is the patient rational release confused drowsy stuporous or comator (3) paralysis—does the patient move both arms and both legs voluntarily or in report to painful stimult (4) aphasia—does the patient talk or its be conscious but unable to talk (5) pulse rate counted for half a minut (6) respiratory rate counted for a full minute (7) blood pressure

Transportation to a hospital where d finit, recursioning and care can be given the patient should be initiated as early as possible with sulfonamide therapy a primary dosure of cramocerebral wounds can be carried out safely as late as 48 to 7 hours after myny Air transport below 3 coo feet altitude is perfectly safe. These patients tolerate tran portation very well particularly before a definitive operation has been performed. It is me important that definitive care be given by a well qualified and experienced neurological surgeon under favorable conditions than that it be given early.

Under conditions of warfare it is usually best even though this procedure requisity to 48 hours of travel to evacuate cramocre bral injuries directly to an evacuation or general hospital located at a sale distance from the combat area where there are highly trined surgical and nursing personnel where xip and operating room faithites are upener and where patients can be held y to 10 days after operation before they are again moved.

#### DEFINITIVE TREATMENT

The term concussion of the brain 1 here used in a broad sense to designate the entit complex of ill defined and incompletely understood pathological processes other the gross hemorrhage which contribute to or are associated with di turbances of consciousies following cranial trauma including so called axonal disruption edema of the brain and cerebrospinal fluid hydrops. The pathological and chimical manifestations of concursor appear immediately after injury and almost always become maximum within the first few

hours Patients who make a satisfactory adjustment during this initial period usually survive

Centrally accepted and well authenticated pecific treatment for cerebral concussion does not exist Surgical decompression is ineffective and often harmful and should not be per formed Lumbar puncture for therapeutic purposes is of questionable value but the cau tious removal of 1 to 2 cubic centimeters of spinal fluid for diagnostic purposes is permis sible Intravenous hypertonic glucose or su crose solution (100 cubic centimeters of 50 per cent glucose or 200 cubic centimeters of so per cent sucrose) has only a temporary effect and some undestrable side effects. Fre quently repeated administration is contrain dicated because of possible renal damage Magnesium sulfate (25 per cent solution 150 to 200 cubic centimeters) given by rectum is an effective means of combating concussion in many instances but it is an expensive procedure both in linen and labor and its general use is not encouraged

Supportive treatment is very important. If this is adequate the great majority of patients suffering from posttraumatic cerebral concus sion uncomplicated by gross hemorrhage will survive Fluids must be given to meet the basic metabolic requirements in all patients with crimocercbral injuries. One thousand cubic centimeters per day may be regarded as the absolute minimum and 1500 cubic cents meters per day as the desirable average. Dur ing hot weather or periods of hyperpyre via the amounts should be increased to 2500 to 3000 cul ic centimeters. Fluids should never be put into the mouth of unconscious or stuporous patients but hould be introduced by rectal instillations hypodermoclysis or very slouly into a vein Not more than 1000 cubic cents meters of the fluids given intravenously dur ing a in le 4 hour period should be in the form of physi logical saline solution. When intravenous fluids are given in excess of this amount they should con ist of 5 per c nt glu cose in 1 stille 1 water

Nutrition must be ustained Diring the 1st 43 to 72 hours after the injury however the patient will need to be given only fluids (1500 to 00 cubic centimeters) and glucose

(80 to 100 grams) After 72 hours the patient will need in addition to fluids and glucose 60 to 80 grams of protein daily and sufficient fats to make up his calone requirements. The fat requirement may be obtained temporarily in whole or in part from the fats of the patients own body but the proteins must be supplied to the patient most conveniently in the form of egg albumin given by the stomach tube to the touch conscious or the stuporous patient feedings must be given by the stomach tube because attempts to feed this type of patient by placing food in the mouth are frequently followed by a piration and neumonia.

The prevention of aspiration pneumonia in the unconscious patient depends largely upon his position in bed. He should be placed on a firm flat bed preferably a fracture bed and supplied with a hard pillow. He should never lie on his back but rather on his side with the upper leg flexed the body rotated well forward the face down and the jaw and tongue dependent. In this position all mucus from the uppermost lung and bronchus the traches the pharynx and the mouth will drain freely out and the tongue will not inter fere with the airpay Unconscious patients should be turned from one side to the other every 4 hours at least and preferably oftener day and night

The prevention of pressure sores of the skin and subcutaneous bases will also be greatly aded by turning the patient frequently. In each position bony prominences must be pretented from direct pressure of the bed or from other extremities. Tissues which have borne the weight of the body should be gently mas saged with a well greased hand after each turning to restore the circulation more fully. The patient should be placed on an air mat tress whenever one is available.

Intracranual temorrhage Intracranual hem orrhage as a complication of closed craniocere brall injuries should be su pected in every patient who continues to get progressively worse following a thow to the head. It may be epidural subdural intracortical or intracister nail in location.

I pidural hemorrhage should be su pected with fractures of the vault. The bleeding is

arterial from torn branches of the middle meningeal artery and hence is ant to be rapid This requires early recognition and treatment A negative exploration is better than one too late Neurological signs may be generalized contralateral or insolateral. Hence bilateral exploration is usually indicated. The site of election for exploratory trephination is just above the middle of the zygoma exposin, the main trunk of the middle meningeal arters If the artery is torn close to the foramen so nosum it may be necessary to plug that fora men with bone wax and the surgeon should be prepared to do this. Considerable blood may be lost before the bleeding point is controlled hence a donor should be present if possible Small evoloratory incisions may be made in the dura mater but it should not be opened widely at this time because runture of the edematous cortex may result. Dramage down to the dura mater for a period of 4 hours may be useful

Subdural hemorrhage is usually venous and occurs from torn cortical or subcortical vent at trately is under sufficient pressure to cause death and it usually stops spontaneously Hence carly evacuation is not so necessary as it is with epidural (arterial) bleeding it may often be delayed profitably until cerebral edema has subsided Since the site of bleeding in young adults is usually the anterior pole of the temporal lobe exploration of the floor of the middle fossa is indicated and this is best exposed through a small osteoplastic flap after the period of acute edema of the brain has subsided that is 5 to 10 days after injury.

A chronic subdural hematoma should be suspected in every patient with a head injury when satisfactory initial progress becomes arrested or whose condition actually deternorates. These chinical changes may inamfest themselves 1 to 6 weeks after the injury occasionally later. The symptoms and signs are usually vague and often fluctuate from day to day or hour to hour. Under such circum stances bulateral exploratory trephination should be performed and the liquefied clot evacuated. Occasionally an osteoplastic flap is necessary if the clot has organized.

Intracortical hemorrhage if arterial is apt

to dissect into the ventricles and be rando fatal If venous it tends to form large th cortical elots and then to stop spontagen is These occur in the temporal lobes in oc per cent of the cases equally on the right and left sides and almost as often contre cout as on the side of the blow These venous dots an rarely fatal They are characterized chincally by preponderance of the focal st ns over those of general intragranial pres ure the exact m verse of the clinical picture produced by face clots They are frequently as ocated with a subdural clot of moderate size. The presence of subcortical clots may be deter mined hy pneumoventriculo raphy or at operation by means of exploratory puncture or incision into the temporal lobe Promo is for the recovery of function after exacusts is javorable even after many weeks have elapsed

Intracisternal hemorrhage is frequently associated with fractures at the base of the skull Bleeding is usually from a tear in ore of the large communicating veins leading from the cortex into a dural sinus and takes place directly into one of the subarachnoidal cu ternae. Since this is senous bleedin, it is not under great pressure. However, fatal results from this type of bleeding are frequent and are due to the fact that the large number of red blood corpuscles in the spinal fluid tend to block the channels over the cerebral remi spheres from which the cerebrospinal fluid is absorbed. The result is an acute hydrorephi lus similar in character to the so called com municating type seen after mening in which postinflammatory adhesions of the subarach noid spaces similarly interfere with the normal absorption of spinal fluid. Pre sure signs u u ally do not appear entical until 1 to 24 hours after injury Bleeding from the sinuses may be lessened by elevating the patient's head and shoulders Spinal puncture is ineffectual in recovering the offending blood corpu des at the point of actual obstruction over the surface of the cerebral hemisphere and pos sibly encourages fresh bleeding by temporarily lowering the pressure applied against the bleeding point There is no accepted surgical measure to be taken against this type of intra cranial bleeding and the prognosis has been considered largely inherent in the injury it self. It may be that temporary drainage of one or both lateral vuntricles by means of small catheters introduced through trephine openings may prove of value. General support the measures similar to those outlined under the treatment for cerebral concussion are in dicated.

Physical and mental rehabilitation of pa tients who have received a craniocerebral in tury requires good judgment and skill The patient must be encouraged in every way to think that the injury has been only a slight one Terms like concussion of the brain and compound fractures of the skull must be absolutely forbidden and in the presence of the patient such simple terms as bump on the head and cut on the head substituted Lumbar nunctures in conscious patients are usually unnecessary and are particularly to be avoided They add little useful knowledge have little therapeutic value and leave a deep and bad psychological scar. An arbitary pemod of bed rest for a to 3 weeks as was for merly practiced is no longer approved. In stead as soon as the patient feels able to sit up or go to the lavatory or to have his meals he should be allowed to do so He should be encouraged to participate in the care of his room and his own person. Physical theraps including passive motion baking massage and electrical stimulation should be directed to paralyzed limbs

If outdat of the scalp Liver, wound of the scalp in matter how small may be a pene trating wound of the skull with injury to the brain Therefore v ray pictures of the skull hould be taken in every case of craniocere tral injury before definitive treatment is be gun to establish the presence or absence of concealed fractures indriven fragments of bone or retained missales

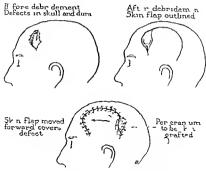
Inmary closure of wounds should be at tempted in every possible case. Each wound of the calp may be needed later as a portal of entry into the intracranial cavity in search of intracranial bleeding. Immary closure may be properly attempted as late as 48 hours following the injury in wounds which have not received any emergency treatment with the suffonamides provided careful debridement

is carried out and vigorous systemic sulfona mide therapy is instituted after the operation Wounds which have received preliminary treatment with the sulfonamides may be closed as late as 2 hours or even 96 hours after the injury. Standard neurosurgical procedures should be followed with conservative debindement and meticulous approximation of the skin edges. Sulfamilamide powder may be lightly dusted into the wounds before closure. There is however a general and growing conviction that with adequate systemic chemotherapy, the local administration of sulfamilamide powder is unnecessary and even undesirable.

Dramawe should be employed rarely with wounds of the scalp and only for the purpose of reheving tension by evacuating fresh blood Drams do not prevent infection this frequently infroduce it. When drams are u ed in noninfected wounds of the scalp they should be led out through stals wounds and should be removed not later than 24 hours after the operation.

Fractures of the skull Simple linear fractures of the skull are of little consequence in themselves apart from the concomitant in jury to the intracramal contents. They are however frequently associated with intracramal hemorrhage those of the vault with epidural bleeding from a torn meningeal arters, and those at the base with bleeding into the basilar cisternae from large veins or venous smuses.

Compound linear fractures are important because they afford a portal of entry for in fections into the intracranial cavity is especially true of fractures compounded through the cribiform plate the accessory air sinuses or through the external auditory ca nal Hence it is important to institute early and vigorous chemotherapy in all such cases Bleeding from the ear indicates a compound fracture into the external auditory canal Gross clots plugging the peripheral portion of the canal may be removed gently but no at tempt should be made to explore the canal clean it or even irrigate it. No cotton or gauze should be placed in the canal The external ear should be covered with a flat sterile gauze dressing



Fg 1 M thod f loss gd f t scalp by hd z flap m thod

Simple comminuted (depressed) fractures should be elevated early to avoid the effects of both general and local pressure upon the brain Compound comminuted (depressed) fractures are frequently accompanied by per foration of the dura mater and laceration of the brain 'X ray studies are mandatory be fore definitive care is instituted. In treating these cases scalp skull and dura should be debrided carefully foreign matter should be picked out devitalized brain removed with the sucker hemorrhage arrested the dura mater repaired and the scalp closed Drains should as a rule not be necessary but if used they should be brought out through separate stab wounds and removed altogether during the first 24 hours. In cases in which sulfona mides have not been administered at all prior to operation primary closure may be at tempted at any time during the first 46 hours after the mury provided that maximum sys temic sulfonamide therapy be carried out postoperatively. In those cases in which sulfamiliamide powder has been introduced into the wound as part of emergency treatment soon after the injury primary closure may properly be undertaken as late as 7 hours after

the receipt of the injury in the majority of

Closure of the dura mater and scalp is to be sou hit mail cases. Large dural defects should be closed by split dural flaps or with free transplants from the temporal fasca the pen cranium or the fascia lata Penicillin (roccounts) if available should be introduced a side the dura upon the underlying and adjacent hearin

The closure of wound of the scalp can be accomplished in most instances after extensive mobilization of the scalp between the galea and pericranium If however this does not suffice then the best way to close a defect in the scalp usually is by means of a sliding flap of scalp having the shape of an elongated horseshoe (Fig. 1) The flap should not in clude the pericranium. In outlining and cut ting such a flap it is important to make it con siderably oversized in both transverse and longitudinal directions because of the complete melasticity of the ti sue If great care is not exercised in doin this the edges intended to be apposed will not meet. The base of the flap hould be wide to insure adequate blood supply to its periphery Edges of the flap not SCARFF

suture I to the scalp should be loosely sutured to the pencranum Drams usually need not and should not be used. The pencranual sur face left exposed after moving the flap should be covered immediately by a Thiersch graft or a skin graft of intermediate thickness. Such grafts are succe sful in a very high percentage of cases. In the are cases in which they do not succeed the exposed bone will be covered quickly with granulations if numerous small will holes are made throu h the outer table.

to the diploic paces. These granulations can

subsequently be covered with pinch grafts or other types of skin grafts. Sulfanilamide pow

der should not be used locally but vigorous

systemic sulfonamide therapy instituted Compound comminuted fractures into the accessory nasal sinuses present troublesome problems. No rule can be laid down for treat ment which will meet the specific needs of every case. In general however the principle should be to repair the scalp and dura mater exactly as in compound comminuted frac tures in other parts of the cranial vault and to do as little as possible to the sinus In dealing with the sinus it is almost a violatic that the kss the surgery the less the trouble The contour of the inus should be re established as far as possible by gentle manipulation with the smooth rounded end of a hemostat or any other similar instrument. Comminuted por tions of the bony walls should be preserved wherever possible and only fragments of bone entirely detached from all soft tissues should be discarded. The mucous membrane lining the mus should be carefully conserved even though badly tom because of the great power of regeneration possessed by this membrane and its strong tend ney to re form a function ing air sinu The frontonisal ducts should not as a rule be touched. Drains should not he used. The langer of scrious intracramal infection is generally less than might reason ably be expected if sulfonamide therapy be aggressively employed. The administration of sulfanilamide powder locally in small amounts is recommended in these cases in addition to the ystemic admini tration of the sulfonamides

Pepair of defects of the frontal bone result ing from compound comminuted fractures in

this region either with tantalum or by bone grafts should not be attempted at the time the acute miury is treated

Rhinorrhea of cerebrospinal fluid persisting for longer than 5 days should be treated by intracranial closure of the internal orifice of the fistula by fasca transplant as soon as a craniotomy may safely be performed. Sul fadiazine should be administered systemically Maximum chemotherapy should be instituted early and maintained for 10 to 14 days after operation.

Penetrating wounds of the brain. The basic principles outlined for the treatment of wounds of the scalp compound fractures of the skull cerebral edema and intracranial bemorrhage apply equally to the treatment of penetrating wounds of the brain. Hemorrbage and shock should be treated according to established principles. Reentgenograms of the skull should be studied before definitive treatment is undertaten.

Penetrating wounds when received for old The fresh cares include those not having received preliminary local or systemic treatment with sulforamides but which present themselves for definitive treatment not later than 36 hours after the wound was received and without signs of active sepsis in the wound at that time also cases which have received adequate emergency sulforamide therapy at the time of injury or soon after presenting for definitive treatment not later than 7 hours after the injury was received without signs of active sepsis in the wound at that time

should have definitive surgery at the earliest possible moment. The entire head should be shaved immediately before operation. A large area of scalp should be cleaned and so draped that any plastic procedure which might be necessary to close the wound such as a large sidding skin flap may be performed. Debride ment of the skin should be conservative. All loose fragments of bone should be discarded. The openings in the skill and dura mater should be enlarged. Devitalized cortex should be exused. The tracts of all large missiles within the brain then should be thoroughly

Carly penetrating wounds of the brain

explored Dirt hair particles of cluthing fragments of hone old blood clots and de vitalized brain must be cleaned out after which the tract should be thoroughly irri gated with physiological saline solution Dam aged and contaminated brain lining these tracts may be removed with a blunt curette or a sucker Penicillin (10 000 units) should then be introduced into the full length of the tract The opening in the dura mater should be closed tightly by the use if necessary in free grafts of the patient's temporal fascia pericra nium or fascia lata held in place with fine sill. sutures Primary suture of the skin must be accomplished over defects in bone and dura mater If there has been loss of tissue of the scalp some standard form of plastic repair of the defect must be employed such as a sliding skin flap

Penetrating wounds of the brain involving the frontal and ethmoid sinuses the anterior nares and the orbital fossae demand special consideration Principles governing the care of compound communuted fractures of this region already discussed naturally apply to these wounds. However in penetrating wound closure of the opening through the dura acquires maximum importance and is really the crux of the successful treatment of these cases In order to close this dural de fect it will u ually be necessary to provide an opening through the frontal bone on the affected side large enough to expose the ante rior pole of the frontal lobe and the floor of the frontal fossa. If the original opening in the skull made by the missile be high in the frontal region extending well above the supra orbital ridge this original opening may simply be enlarged with rongeurs. If on the other hand the tract of the mis ile has involved only the bony structures of the floor of the anterior fossa, and not the anterior wall, then surgical exposure of the fossa should be through a small osteoplastic flap. The dura when exposed should be opened sufficiently to admit exploration of the anterior pole of the frontal lobe and the floor of the frontal fossa includ ing the portal of entry of the missile Bone dura and brain about this opening should be dehrided and a careful toilette nf the free space between brain and dura made Un

fortunately the direction of the tract of the mussile is usually such that its exploration is impossible without making fresh deep i a sinns through the brain a measure which is rarely justinable A free graft of temporal fascia pericranium or fascia lata should be laid over the defect in the bone made by the missile This graft should be large enou h to allow generous overlap at all margins Only rarely will it be possible to suture the graft is place effectively However this is not necessary for if the graft he large enough and not too much brain tissue has been lost as a result of the injury or hy debridement the weight of the released frontal lobe and its slight tendency to expand after the retraction will hold the graft securely in place until fibrinous union between it dura and exposed hone takes place The surgical incision made through the dura should then be closed with fine silk sutures Penicilin (10 000 units in 2-, cc) should be introduced into the subdural space The local use of sulfamiamide in the region of the graft is undesirable since it will attract fluids which may loosen the graft The galea and the scalp should be closed with interrupted fine silk sutures without drains e Maximum doses of sulfadiazine and peni illin should be given systemically for 10 to 14 days after the operation Great care should be taken to prevent upper respiratory tract com plications during the postoperative course since violent sneezing or coughin, mi ht d. lodge the graft

The removal of bony fragments from the hrant is of the utmost importance. Experient has shown that cerebral abscesses dyelop around 50 per cent of hone fragments not removed. The smaller metallic fragments to stitute an such danger and attempts to it move them should not be made at the risk of damaging healthy cerebral tissue. It is desirable however to remove the larger miss.

Cerebral abscess should be suspected wit ever normal recovery from a pental wound of the head is arrested Preumova traculography may properly be performed under such curomstances. If an abscess be preent it should be treated by any one of ite standard methods.

Late penetrating wounds of the brain are those not included in the above categories The majority will be septic. In addition to cellulitis of the scalp many will already have developed osteomyrlitis cerebritis meningi tis cerebral abscess or cerebral hermations and fung: Treatment of these conditions will of necessity be determined by specific indica tions in the individual cases hence proce dures will vary with each patient and for each complication Cellulitis of the scalp should be treated with chemotherapy and in accordance with standard surgical principles Osteomyeli tis of the kull requires free dependent drain are of the bone and the adjacent covering soft ti sues with removal of sequestra as they form in addition to intensive chemotherapy Radical bloc resection of large portions of the skull usually gives disappointing results and is not advocate! Preliminary studies with penicillin indicate that it may be par ticularly effective in the treatment of osteomyelitis. Sulfonamide therapy should be used actively Meningitis and cerebritis can be treated only by the sulfonamides and penical lin but re pond favorably in a majority of cases Cerebral ab cesses may be treated by whichever one of the commonly accepted methods the neurological surgeon prefers Uscesses secondary to penetrating wounds are usually due to retained bone fragments or other foreign matter along the tract of the mi sile Exploration of the tract with removal of bone fragments and foreign material fol lowed by a hort period of dramage is the method of choice and offers a good prognosis for rapid healing Pathology and treatment of ceretral bernsa

tion Cerebral hermation and fungus formation occur whenever there is a defect in the dura mater bone and kin overlying, the brain and is due to the fact that no tructure opposes the intracranial precure which tends to push the brain out through the def ct. Cere bral bermations wavanably become indicted and there is u ually some necro is of superficial to use due to interference with the blood call to use due to interference earth the blood call to use due to interference minimum the beamation. Veerbral hermation which thus becomes infected and partially necrotic is designated as a cerebral fungus. If the intracranial pre-ure remain

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normal the outward extrusion of the herma tion or fungus as a rule gradually comes to rest the necrotic tissue is removed by natural processes and the surface of the brain becomes overed with granulation tissue and eventually scar tissue. This scar tissue in time contracts with sufficient force to counteract the expanding action of the intracranial pressure and will in favorable cases finally reduce the herma completely to the general contour of the cranium. It then remains only for the surface of the scar tissue to become epithelialized which may take place pontaneously from the edges of normal skin or may have to be accomplished by grafting.

The primary object in the treatment of eere bral hermation is to keep to a minimum the protrusion of cortical tissue through the defect in the skull. In attempting to achieve this end effort should be directed primarily at minimizing expanding pressure within the skull rather than by attempting to hold the brain within the cranial cavity by applying pressure against it from without by means of pressure dressings. This latter procedure is almost always ineffective against continuous and elevated intracranial pressure and in addition causes pressure necross of the hermating brain and greatly increases the amount of local sepsis in the brain tissue.

Measures for reducing intracranial ten ion should include maintaining the patient in a sitting posture in bed whenever pos ible Spi nal drainage with removal of 30 to 50 cubic centimeters of spinal fluid should be per formed twice daily for to 4 weeks until no crotic and infected tissue has been removed from the surface of the hermation and the exposed brain is covered with a clean layer of granulation tissue. Great care mu t be exer cised to keep the patient from acquiring upper respiratory infections which will force him to cough and thus violently force protrusion of a cerebral herma Also similar precautions must be taken against nausea and vomiting The bowels must be kept open with the aid of laxatives ince straining at tool and even the administration of enemas greatly increases intracranial pre sure

Local sepsis mu t be aggressively combated Wet compresses Dakin's solution or sulfona mide dressings should be applied to the sur face of the hermation or fungus until all ne crotic tissue has been removed and exposed brain has been covered by healthy granulation Thereafter the granulating surface should be treated as any other granulating surface the essential principle being the use of a lubricated dressing which will not interfere with the ingrowth of epithelium over the mar gins of the wound Superficial marginal ah scesses must be constantly looked for and effectively drained when present. These are apt to occur beneath the overhanging edges of scalp bone or dura mater. In the very be ginning it is important to have the opening in the bone larger than the opening in the dura mater and the opening in the scalp larger than the opening in the bone in order to prevent abscess pocketing by overhanging tissue

The hermation must be protected from the rect pressure by a firm ring of cotton or gauze. Direct pre sure will produce necrosis and an increase of local infection. As superficial its sue is lost through necrosis and seps; the lateral wall of the ventricle; approached and the danger of meningitis and repture of the ventricle with leakage of spinal fluid becomes immunent.

Pers tently progre sive hemiation after 3 to 4 weeks of proper treatment or excessively rapid hermition indicates pathologically elevated infractanial pressure. This is usually due to the presence of an intractanial abscess which may be extradural subdural or infracterioral. Yray evidence of retained bone fragments may reveal the site of the abscess. If the plain xray films offer no help pneumo sentinculography is indicated.

A new alternate method for the treatment of cerebral hermation has recently been advo-cated. This consists of forcibly reducing the hermation and holding it in place within the craimal cavity by means of a perforated tan talum plate which is securely fixed into the defect of the skull. The irritating effects produced by gauze or other types of restraining tensing is greatly minimized with such a tantalum dressing and the vicious pathological eyele resulting from progressive or con

timious herniation is avoided. The outer sur

face of the tantalum plate is in turn covered

by a sliding flap of calp. The complications from infection which multi-reasonable be expected are reported to be infrequent. It spite obvious objections this proved reasonable interpretable to the sound in principle to recommend it. It is to soon however to make a final appraisal of the method at this time although report date make further application in selected cases instifiable.

## SPINAL INJURIES IMMEDIATE TREATMENT

Injuries of the cervical spine resulting from indirect trauma are almost invariably forward disdocations of the head and upper part of the cervical pine upon the lower part with a pathological anterior angulation at the level of the lesson. In the production of the injurior or or more of the articulation facets of the involved vertebrae may be chapped off but involved vertebrae may be chapped off but these small fractures must always be result of as secondary to the dislocations. Determination of the exact level of the fractured location is unimportant for the emergency treatment.

The discuss of fracture di location of the cervical spine should always be suspected whenever an injured man complains of severe pain in his neck. The diagnosis should be made definitely whenever an injured man unable voluntarily to move either his arm of less.

The most important punciple in the emigency treatment of fracture-dislocations of the
spine is to do nothing which will increase the
bony deformity. Do not move the panies
miless absolutely nices, any for each new mont
ment may cause hone to cut unto the spinal
cord. Do not raise the patient is head to give
him a drink or a ci arette. Do not put a rolled
blanket or pillow beneath the brad. Do not
fift the patient off the ground unless he is on a
litter or other rigid support. Reduction should
not be attempted. Plaster casts hould not be
apphed

The patient with a fracture-dislocation of the cervical pine is in the optimum position when he is lying on his back with a foliacl blanket 3 to 4 inches thick beneath his should be shoulders and his need, in slight dorsifierion to the level of his shoulders and his need, in slight dorsifierion

(hyperatenson) Folded blankets should be secured at both sides of the head to prevent lateral movement. A patient with a fracture dislocation of the cervical pine should not he face down with his neck twisted nor upon his ide with his neck feed laterally. Care should be taken that clothing and blankets are smooth beneath the patient. Pockets should be emporited that the patient.

Three persons are needed to turn properly a patient with a fracture dislocation of the neck onto his back from some less favorable posi-The senior of the three men should gra p the chin and occiput and exert steads traction in the line of the long axis of the body The second man should grasp the ankles and exert equal countertraction along the axis The third man should then kneel beside the patient reach across his body and grasp the patient's clothing near the shoulder and near the hip joint with his two hands. He should then gently rotate the patient toward himself while the men at the head and feet exert their traction. The head neck body and legs should all be made to move simultaneously A folded blanket 3 to 4 inches thick should be so placed on the ground or the litter that the patient's shoulders finally come to rest on top of it when rotation has been completed This position will allow the head to hang down slightly and permit a moderate dorsi flexion (hyperextension) of the cervical spine - a position which tend to correct the deformity caused by the fracture dislocation

I patient with a fracture dislocation of the cervical pine hould never be lifted from the groun I on to the litter he should be rotated ir pulled on to it. In transferring a patient from the ground to the litter the latter should be place I beside the patient. If he be lying face d wn upon the ground he may be rotated on to the litter in the minner de cribed in the precedin partgraph coming to rest on his lack with the folded blanket beneath his shoulders If the patient be lying face upward on the ground the three men hould take the same positions as for turning him with the exception that the man at the side should gra p the patient's clothing on the s de nearest to himself. The three men then gently lide tle patient from the ground on to the litter without lifting him the two men at the head and feet meanwhile maintaining a strong lon gitudinal traction

The prevention of pressure sores is a major problem in all paralyzed patients Efforts should be made from the beginning to keep pressure off the sacrum and the heels. When ever possible the paralyzed patient should be placed upon an air or other soft mattress during transportation.

Urnary refention is common with spinal cord injuries Extreme di tention of the blad der must be avoided An inlying catheter should therefore be introduced before distention of the bladder occurs and especially be fore transportation of the patient to a distant point is initiated. The catheter must never be clamped. If cystitus should develop it will not become serious as long as drainage is free and it can be readily cleared up with the aid of tidil drainage and sulfonamide therapy at the hopital to which the patient is taken. Cystot own should not be performed.

Morphine should not be given to patients who have received injuries to the cervical spiral column

All patients with fracture-dislocation of the cervical spine should be transferred as early as possible to a hospital where definitive neurosurgical treatment can be given

The common lesson of the lumbar spinal column is a compression fracture of the body of the first lumbur or adjacent vertebrae. This results in an anterior angulation of the spinal column which causes compression of the pinal cold Dislocation between the vertebrae is uncommon at this level. The diagnosis hould be supected whenever an injured man complains of a severe pun in his lumbar pine and should be made definitely whenever such a man is unable voluntarily to move his less.

The fun lamental principles for the emer gency treatment of compris ion fractures of the lumbar spine are essentially the ame as for fractures of the cervical pine. The patents should not be moved unle at its absolutely necessary. He should not be picked up and carried from one place to another unle she has first been placed upon a litter or other rigid structure. There are two acceptable positions for a patient with a compression

fracture of the body of one of the lumbaraer tehrae. If an air mattress is available, the natient should be placed upon it lying upon his back with 2 or 3 folded blankers under neath the air mattress at the site of the frag ture so placed as to produce hyperextension of the spine. If an air mattress is not as allable then the best position for transport is the face. down position. This position automatically prevents further anterior flexion of the lumbar spine. It also prevents the formation of pres sure sores at the point of angulation of the spine and over the sacrum However in this position the toes knees and cenitals must be protected against pressure. No other attempt at correction of the bony deformity should be made at this time. Plaster casts should not be applied to any patient with a spinal cord in jury having anesthetic skin

The principles involved in turning a patient with a compression fracture of the lumbar pine are similar to those for turning a patient with a fractured cervical pine except that in fractures of the lumbar spine fraction by the man at the head of the patient may be applied under the armpits. In transfering the patient from the ground to the stretcher the same principles apply, as in the case of a patient who has a fracture dislocation of the

neck

The principles which underlie the prevention of pressure sores and the care of the blad der in patients with a compression fracture of the lumbar spine are the same as those which apply to the patient with a fracture dislocation of the cervical spine. Morphine may be given as necessary to control pain and the patient should be transported as early as possible to a hospital where definitive neurosurgical treat ment can be given

Compound injuries of the spinal column are usually the result of gunshot wound. No at tempt at definitive treatment should be made at the site of the accident. Sulfanilamide pow der should be dusted lightly, into the wound Large protective diressings should be securely applied. In all other respects the patient should be treated and transported in accord ance with the principles outlined for the care of closed spinal injuries. Since penetrating wounds of the spine are frequently associated.

with wounds of the lungs or abdomi al vecera such complications should be looked?

#### DERIVITIVE TREATMENT

Quantitative relationship between injur to bone and injury to pinal cord does not ent: The differential diagnosis between anatorical severance of the cord and a simple and terporary physiological interruption of function i often difficult or impossible to make clinical during the early postfraumatic period lifene the dictum that all cases of paralysis follows spinal injury must be treated as though the were suffering from a recoverable lesion until proved otherwise.

The neurological signs present after pull injury may be due to any one or a combination of the following pathological factors (a) edema of the cord (b) hemorrhs e into the cord (c) compression of the cord by a placed vertebrae and (d) anatomical section of the sunal cord.

Edema of the spinal cord occurs with even serious injury of the spine It develops rapidly and is often extreme Within an hour after in jury the spinal cord may be two or three times the normal diameter so that it fills the dural This is the most common envelope tightly cause of manometric block (positive Quecken stedt sign) during the first few days after in jury If the dura mater is opened at this time spontaneous rupture of the spinal cord with anatomical loss of continuity may result manametric block therefore hould not be considered as an indication for laminectomy during the scute posttraumatic period. The clinical signs produced by severe edema of the cord are indistinguishable from those poduced by transection of the cord durir the first 4 to 48 hours after mjury They tend to improve after the 4th or th day and compete functional recovery from total paralysis may follow quickly

Hemorrhage may occur into the extrad est subdural and subarachnoid spaces b t in these ites it rarely causes compres nor of a significance. Hemorrhage into the cord tell is limited almost invariably to the central grup matter (hematomy-lea) Here b'éedin

may di se t its vay up and down the grey matter for a number of segments The clot thus formed never attains sufficient diameter to cause compression of the long tracts adja cent to it or to require decompressive meas It produces its effects by disrupting neurones and reflex arcs at segmental levels producing motor effects of the lower motor neuron type 1e flaccid paralysis muscle at rophy and hypotonic reflexes. After houe faction and absorption of this clot some return of function may be expected in the affected reflex arcs Surgical evacuation of these intra spinal blood clots produces irretnevable dam age to segmental neurons and reflex arcs and this procedure therefore should not be per formed

Compression of the cord by displaced bone is a less frequent cause of persistent paralysis following pinal injury than is generally assumed to be true. This is because the bony neural canal is on much larger than the spinal cord that considerable encroactiment upon the lumen of the canal may take place without serious pressure upon the cord. Notwith standin this general anatomical fact however correction of lony malatigment and deformity following spinal injury is important and should be performed as oon as it can be properly done.

Typical skeletal deformities of the spine may follow either direct or indirect violence breet trauma to the spinal processes and laminate due to libows from the reru in which the laminae are fractured and driven into the bony canal is rare with the closed type of in jury but common with gunshot wounds Wien encountered immediate laminectomy with the runoval of the offending bone is indicated. This is the only type of spinal in jury which offers in also liberation of ran early Jaminectomy.

In lirect trauma of the pine produces type cal deformities In the cervical spine there is usually occurs a forward dislocation of the heal and the upper portion of the cervical pine over the lower portion of the cervical pine. This may be unaccompanied by any fracture but it is usually accompanied by a fracture of one or more, of the articulating freets of the affect! vertetire It hull

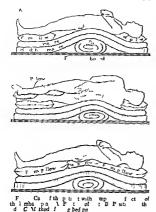
be borne in mind however that the essential lesion is usually that of a forward dislocation and that the fracture of the articulating proc esses is secondary. This typical injury is referred to as a fracture dislocation

In the thoracic spine the plinting afforded by the thoracic age is so great that fractures evere enough to produce neurological signs rarely occur unless the trauma has been of extreme violence as when for example a per son falls from a great height or is thrown from a rapidly moving which against a telegraph pole or tree. Under such circumstances ribs are usually broken destruction and malalign ment of the pinal column are tremendous and the spinal cord is swallly transected.

In the lumbar spine following sudden arrest of forward motion of the patient s body the strong articulations between the vertebrae bidd fast but the bodies of the vertebrae give way. The resulting and typical lesion is a compression of the body of one or more of the lumbar vertebrae usually just below the tho racic cage. Dislocation between the vertebrae either forward or lateral is rare and acute for ward angulation is the main deformity.

The treatment of bony deformities depends upon the nature and site of the injury. Depressed fractures of the laminae require immediate laminectomy and the elevation of depressed bone

Fracture dislocation of the cervical spine is best corrected by closed traction methods Laminectoms with open operative reduction is usually not only unnecessary but is strongly contraindicated and should not be employed The best method of reduction is by skeletal traction applied with the skull tongs cribed by Crutchfield Halter traction with straps applied around the occiput and beneath the chin is unsatisfactory because it is ex tremely uncomfortable it interferes with movements of the jaw in eating and talking and it tends to produce pressure sores beneath the chin and at the occiput. I urthermore considerably less traction may be applied by this method. The former practice of rapid reduction using traction of great force with the immediate application of a plaster cast extending over the occiput and chin down over the thorax is no longer justifiable with the



newer methods now available. Frequent v. ray examination should be used to control the reduction of the fracture dislocation at all sta es both early and late. Traction should be maintained until sufficient time has elapsed for firm fibrous union to be established be tween the injured vert brae and this usually requires at least 6 weeks in severe injuries 12 weeks. Weight bearing should be deferred in the repair of bone is well under way patients therefore should remain in bed in a prone position for approximately 12 weeks after removal of traction. When the patient finally becomes ambulatory he should wear a plaster or a leather collar for 6 months or more

Fractures of the thoracc spine with the usual gross mi alignment of the vertebrae can not be satisfactorily corrected by any method open or closed. The spinal cord has usually been transected at the time of injury and prognosis for the recovery of spinal puncture is hopeless. Laminectomy is usually futile and hence contraindicated.

Compression fractures of the lumbar pa do not require surgical procedures Lamies tomy is strongly contraindicated in most care These deformities are best corrected by closmethods of hyperextension Fracture board are first placed upon the bed to prevent se ging Two or 3 blankets are then made L to 1 roll the width of the bed and approximately 18 inches in diameter Thi is placed across the bed on the fracture boards at the level of the spinal injury A hard hair mattress is placed over the blanket roll and on top of the a softer mattress preferably an air mattres. if one is obtainable. The curved surface of the uppermost mattress will then conform appear imately to the normal lumbar curvature of the healthy spine When the fracture bed has thus been set up the patient is gently lifted on to it face up in such a position that the site of the injury lies above the blanket roll. The weight of the upper and lower parts of the body will then serve slowly to bring the ly phosed spine into a position of normal lumbar lordosis This method of reduction is far more efficient and less traumatizing mentally and physically to the patient than is the older method of reduction by suspension upon a canvas hammock (Fig. 2a)

The bed care of patients with fractured spine is of prime importance. In order to change bed linen or to bathe these patients they may be turned on their side without risk of injury if the bed has been properly set up. The soft tissue between the hip the pelvis and the lower edge, of the thorax will conform very satisfactorily to the curvature of the led as the patient is turned without permuture semificant lateral missingment of the spinal column. Moreover, the large intervertiberal articulations at the level of the lesion are rarely damaged sufficiently to allow lateral missingment (Fig. 2 b).

In using the bed pan the pattent is rotated gently to one side. The bed pan is the placed in the center of the bed and firm piloso or folded blankets having the same thickness as the bed pan itself are placed on the bed above and below it. If these pillows or Vian Lets have the correct thickness and firmness and are properly placed the original curvare of the top mattress is preserved (Fig. 2d).

The patient is then slowly rotated on to his back so that his back and legs are supported at exactly the same level as the bed pan. In this way hypervetten ion of the spine is main tained. Ybed pan should never be placed be neath a patient with a compre suon fracture of the lumbar vertebrae unless these precautions against intelleuon are first taken. Another method of evacuating the bowels of a patient with a fractured spine is to place him upon one side and carry out colonic uringstion.

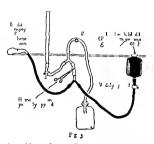
Prevention of hypostatic pneumonia is a major problem during the first days of treat ment in all fractures of the spine. In fracture dislocation of the cervical spine specific injury often occurs to the 4th and 4th cervical seg ments fmm which the phrenic nerves inner vating the diaphragm take origin. In addition to this the attendant edema of the cord tends to interfere with the passage of impulses from the respiratory center of the brain to the respi ratury musculature of the thorax For these two reasons respiratory movements are apt to be hallow Coupled with this is the fact that the patient is lying on his back in which posi tion it is difficult for him to clear his mouth and posten or pharyng of accumulated mucus Should signs of impending pneumonia appear it is imperative that treatment of the pneu moma tale precedence over treatment of the fracture for the mason that an accurate align ment of spine is of no value if the patient dies of pneumonia Accordingly any patient threatened with or suffering from pneumonia must be turned from one side to the other every 2 to 3 hours day and night to permit free drainage of exudate and mucus from first one I all and then the other half of the re pirators tree. We other upportative mea ures gener ally emplyed in the treatment of pneumonia should of ourse be utilized

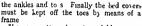
In compression, fractures of the luml strong programment is caused by a different mechanism. The continued hyperextension of the 13th causes the rectus muscles of the all men to pull upon the lower ribs. An exist trainmitte peno titis frequently develops at the point of attachment of the rectus muscles. This mas be quited justifial and cause musclimaters planting of the lower part of the thoracic cage. This limitation of re piratory.

movements in the lower lobes of the lungs pre disposes to the development of hypostation pneumoma in much the same way that spint ing of muscles after upper abdominal operations does. These patients must be given sufficient morphine during the first few days that they are lying in hyperextension to mask the pain due to the mechanism ju t de cribed. If this be done promptly and adequately respiratory movements will be inhibited only slightly and the tendency to hypostatic pneumonia greatly reduced. Should pneumonia develop the same general principles regarding its treatment apply in the lumbar fracture as in the cervical fracture.

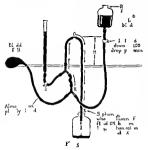
Abdominal distention may occur during the first few days after an injury of the lower tho racte spine due to interference with the autonomic nervous system. It should be dealt with vigorously along the same lines used in treating paralytic ileus following abdominal operations. Passage of a Willer 1 bibott tube into the upper alimentary tract is the best method. I thressin (i c c ampul) or prostig mine (i c c ampul) may be given intramus cularly. Rectal tubes should be used. Enemas of soap suds or water and glycerne may be tried. Hot stupes to the abdominal wall are often effective. As a rule distention is rarely critical and is usually short lived.

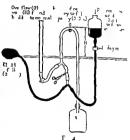
All so called bed sores are pressure sores and are invariably the result of local ischemia caused by continued pressure upon soft tissues. It is no longer permissible to re gard pressure sores as trophic disturbances I revention is the best treatment. This de mands constant vigilance to prevent continu ing pressure by a hard bed or by other parts of the boly upon soft tissues overlying bony prominences Wherever possible a paralyzed patient hould be placed upon an air mattress Is a rule the patient may be on he back on such a mattress indefinitely without develop ing pressure ores of the slin over the sacrum Lven with an air mattre a however it is nec essary to keep the heels off the mattress by placing a firm pillow or a folded blanket of sufficient thickness crosswise beneath the calves of the legs so that the heels do not touch the bed Small pillows or cotton pads mu t also be placed between the knees and between





If an air mattress be not available pre-ention of pressure sores i very much more difficult. Under these circumstances air rings when available should be used to protect bony prominences. If these be not available the surgeon must rely upon frequent turning of the patient and the use of cotton pads at vulnerable points to prevent the development of pressure sores.



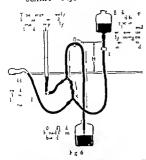


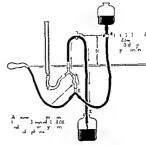
The treatment of evisting pressure ore should follow the same basic sur real principles applying to the treatment of other wound containing infected and necrotic tisse. All deviatalized skin fat and subcutaneous tissue must be excised immediately with scaple or exissors. Wet saline compresses Dakin so follotion or most sulfonamide dressin a must be applied to the infected base until it is covered by healthy granulations. Skin grafts may be used to basten healing.

Plaster casts should not be applied to the trunk and extremities of any patient with a spinal injury having anesthetic skin

Care of the hladder is a major problem in every paralyzed patient. The purposes of treatment are twofold (a) the prevention of seriou sepsis of the urnnay tract and (b) preservation of normal bladder capacity and musculature. The former is necessary for the preservation of life but the latter is very important if the patient is to make a ausfactory social adjustment after his recovery from the acute phases of his injury. In an effort to attain the former objective the secondary objective should not be ignored.

Extreme di tention of the bladder should be avoided at all times as a first principle. An in lying catheter should therefore be introduced at the time emergency treatment is given before distention occurs and especially before the evacuation of the patient to distant

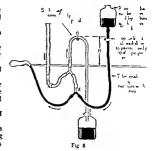




points is initiated. If cy titl divelops it will not become senous provided drainage be free and the bladder mucous membrane has not been fissured or the muscular walls paraly zed by extreme distintion. It can be readily eleared up with the aid of tidal drainage and sulfonamide therapy at the hospital to which the patient has been evacuated. The in lying eatheter should be as large in ealiber as the lattent will readily tolerate.

Indal drainage is con idered the method of choice in the treatment of the paralyzed blad der and should be instituted as soon as the paralyzed patient is received in an established ho pital Should standard sets not be avail able at the time needed the neurosurgeon should improvise tidal drainage along ac cepte l lines. There are several acceptable forms of trial drainage one is here shown for purposes of reference (Fig 3 to 8) It is impor tant that the catheter and drainage tube should be I rought out over the thigh rather than al lo rd to fall down between the thighs and he along the bed In this latter position an acute angulation of the urethra occurs at the level ol the suspensory ligament which will con tribute senou is toward the production of irritative urethritis By bringing the tube lat erally over the thigh this angulation with its resultant urethritis is prevented. The in lying catheter should be removed approximately once a week. This should be done in the morn ing and a new catheter should not be replaced until late in the day. This allows 8 to 10 hours for voluntary micrution to occur if the blad der mechanism is ready to assume that function. If voluntary micrution does not occur the catheter should be replaced and tidal drainage continued for another week, when the procedure outlined above should be repeated.

Voluntary control of the bladder often does



and tidal drainage should not be discontinued before that time without good and specific cause. Even in cases in which the spinal cord has been completely sectioned at the time of hispury an automatic type of bladder can usu ally be established after 8 to 12 weeks. After removal of the catheter in such a bladder there is no dribbling of urine and periodic ordings of 150 to 300 cubic centimeters of urine can be initiated voluntarily by abdominal straining or by sustained pressure applied manually to the abdominal wall over the bladder area hy battent or attendant at nendoc intervals.

Cystotomy should not be employed when total dramage by urethral catheter is available unless that method has been fully tried and proved unsatisfactory. The only absolute medical indication for cystotomy is a fulliniating urinary infection which has not responded satisfactorily to tidal dramage. A high cystotomy is preferable to a low one This procedure should be performed by a urol

ogist if he is available

Compound inturies of the some usually re sult from gunshot wounds and often are associated with penetrating wounds of the thorax or abdomen Early laminectoms with full exposure of the cord is usually indicated but must be regarded as secondary to the treat ment of the thoracic or abdominal wound Splinters of hone and metal should be removed from the canal when their presence threatens damage to the cord Sulfonamide bowder should not be directly introduced into the spinal fluid or onto the cord although the small amounts which may get there from other parts of the wound will cause no dam age Disinfection of the cerebrospinal fluid should depend upon a high blood level of sulfadiazine and with this drug the cerebrospinal fluid level is about half that of the blood level The dura should be closed if possible to pre vent spinal fluid leak. A free transplant of fascia may be used to accomplish this if neces-Sulfanilamide powder should be lightly sprinkled about the exposed bone and through out the muscular and fascial layers. These tis sues and the skin should be closed without dramage otherwise a spinal fluid leak with formation of a fistula and with terminal menin gitis is apt to occur

Recovery of function in extremites a 4 sphinicters after severe spinal injury may me quire weeks or even months. If meticoles care of the skin bladder and limbs including the sphinic of a single passive motion of a ints and cortext the sphining be maintained many exemptly hopeless cases will recover a great measure of useful function.

#### PERIPHERAL NERVE INTERIOR

In simple lacerations of soft fissue made with sharp edged or pointed instruments peripheral nerves are often divided cleanly with minimal contusion of the nerve truth on either side of the division and without loss of nerve tissue either immediate or late. In such case, the two ends of the divided nerve can be easily approximated without tension. Suture of the nerve in this type of injury may be performed at the same time that first surgical ear is given to the flesh wound provided that the wound is fresh suitable instruments are at hand time is sufficient and other circum stances furnished.

Accepted surgeal principles and technique should be employed in repair of both nerv and flesh wound. Interrupted sutures of fine silk or tantalum ware placed in the epineumishould be used for suture of the nerve. The mary closure of skin is mandatory if sutures of the nerve has been performed. Drain surgenerally undesirable but if considered temporarily necessary on account of occur they should never come in contact with the sature line of the nerve and should be removed duture the first 4 hours after operation.

Sulfanlarmde powder may be dusted lightly into the wound and about the suture lim This dru, bureases scar tissue reaction slightly in the soft tissues about the nerve but doe not interfere with the regeneration of the nerve. Evidence is accumulating however to indicate that sulfadazine given by mouth in sufficient quantity to munitain a high blood level of the drug afford as great or even greater protection avainst infection than does sulfanilamide powder placed directly in the wound without certain undesirable secondary effects caused by the latter procedure.

In the severe penetrating or crushing wounds commonly encountered in war in

which major nerves have been divided defini tive suture of these nerves at the time of first surgical care while theoretically desirable is almost never feasible The reasons are as fol lows In the first place in badly contused nerves the full extent of the intrinsic hemor rhage and other damage to the brused ends of nerves cannot be immediately appraised nor can the ultimate line of demarcation be tween viable and nonviable nerve be deter mined Second if much of the nerve has been shot away reapproximation of the ends of the divided nerve will be possible only if the nerve is mobilized for considerable distance on both sides of the injury. To carry such dissection away from a grossly contaminated and potentially infected field proximally into clean tissues would entail serious and unnec essary risks. Third proper mobilization and suture of a badly damaged nerve might well require several hours of operating when neither the patient's condition nor the execucies of the situation would justify the expenditure of so much time And finally the surgical necessity of leaving most battle wounds of soft tissue unsutured for , to 10 days after initial dibridement would almost certainly result in a breaking down of the line of sutures

In practice battle wound usually do not reach the surgeon until 12 to 48 hours after they have been incurred at which time the first concern is the prevention of sepsis in the soft tissues e pecially gas bacillus infection This is dependent largely upon proper de tridement of the wound. Debridement of the skin should be conservative but exploration of the wound should be very thorough. The tracts of mis iles should in most instances be lat l open all foreign matter such as bits of dothing should be scrupulously sought out and removed and all muscle which appears deprived of its blood supply badly era hed or gro sly contaminated should be excised The free ends of divided nerves if these be seen should be drawn together when possible with several temporary sutures of fine catgut or tantalum were placed in the epineursum to prevent retraction of the nerve ends pending hnal definitive suture at a later date. Silk utures should not be used for this purpose as the ilk will remain as infected foreign matter

The wound is not sutured but merely covered with a protective gauze dressing. It is best not to introduce sulfanilamide powder locally into the wound but a high sulfa level in the blood stream should be early established and maintained by the systemic administration of sulfadiazine.

Secondary closure of the wound may usu ally be performed 5 to 10 days after débride ment At the time this is done there should be a therapeutic sulfonamide level in the blood stream The edges of the skin should again be freshened up and granulation tissue trimmed away The skin should then be un dermined and mobilized as much as necessary to effect approximation of its edges and su tured with simple or vertical mattress sutures Moderate tension is well tolerated and is justified if necessary to effect closure Drains are not needed and should not be used Neither sulfanilamide or penicilin should be placed in the wound but a therapeutic level should be maintained in the blood until the wound has healed Sutures may be removed as a rule after 7 to 10 days and the wound may be regarded as healed 2 to 3 weeks from the time of operation

The final definitive suture of the nerve may be performed 2 or 3 weeks after the sutures have been removed. At this time proximal and distal segments of the nerves should be exposed and the ends of the nerves freed from surrounding cicatrix intrinsic scar tissue ex cised from the terminal ends of the nerve see ments the nerve trunks mobilized as ex tensively as necessary to obtain approxima tion of the segments without tension and end to-end suture performed The fundamen tal requirement for all nerve suture is that it be done without tension. The actual suture hould be made with interrupted sutures of fine silk thread or tantalum wire placed only in the epineurium Following this the extremity should be immobilized with neighbor ing joints in positions of flexion for approxi match 3 weeks After this another 3 weeks should be allowed to get the extremity again extended

Physical therapy hould be instituted about the third week after suture. This should in clude daily massage to improve circulation passive and active motion to keep joints ten dons and muscles supple and galvanic stimulation applied directly to individual denerated muscles to preserve the contractifity of muscle element and to prevent the atrophy of disuse. The minimum effective galvanic stimulation consists of 30 contractions of each paralyzed muscle repeated three times daily three days each week. More frequent stimulation is of course desirable. Splints should be used as needed to reenforce weakened or paralyzed muscles a diprevent contractures but these plusts to '!b
be of such a type as to allow free voluntaand passive movements of all joints. If pluster-of Paris splints are used they should be
worm only at might and left off during the
daytime and the patient encouraged to carry
out maximum passive and active movements
during his waking hours.

# THIOURACIL—ITS USE IN THE PREOPERATIVE TREATMENT OF SEVERE HYPERTHYROIDISM

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IN FRIENCE obtained from the clin ical use of thiouracil over a period of 2 years permits certain conclusions regarding this potent biochemical Thiouracil does reduce the elevated metabolic rate of hyperthyroidism to normal if it is administered over a sufficient length of time in addition there is a gradual disappearance of all hyperthyroid manifestations except those of the eyes if these manifestations are very pronounced before treatment is be Conclusive proof has been definitely established that thiouracil possesses great therapeutic value in the preoperative manage ment of severe hyporthyroidism Consistent and permanent remission of hyperthyroidism by prolonged administration and then with drawal of thiouracil seems highly unlikely Consideral le time and further careful observations will be required to determine this pos ibility

I utthe companisons can now be made be tween the pathologic physiology of the hyper thyroid glan I under iodine therapy and that following thiourical administration. Observations have been made, on the thyroid tissue removed at operation from patients receiving thiourical alone and thiourical in combination with jodine. An attempt will be made to

evaluate the findings

This report will be diccussed under 3 head us (s) chinical observations on severely hyperthyroid patients prepared for thyroidectomy with thiouracil (2) comparison of the action of Lugols solution with thiouracil on the hyperthyroil gland and (3) pathologic of servations on thiroid tissue removed at operation from patients treated with thiouracil and property of the property of t

Drs. W rem ad Messaer no. 1 th. Armed Servi ex. Irom b. I epartments of recty. d. 1 em l. Med. m. Labre Cl. 3. 4 b. Departmen. f. P. thology. New b. 1 and Dearconess Hose. 1.

#### CUNICAL OBSERVATIONS

Thiouracil has been used at the Lahey Clinic in the preoperative management of severely toxic hyperthyroid patients since May 1943 In dealing with the hyperthyroid patient surgically we were convinced early that thiouracil is of great advantage since it has the power to bring about a positive remis sion in patients who are dangerous risks or who are so toxic as possibly to require mul tiple stage procedures. In addition to elimi nating two stage thyroidectomies entirely deaths which result from so called postopera tive thyroid storm or reactions are avoided Patients with mild hyper with certainty thyroidism continue to be prepared with iodine since in this group sufficient improve ment occurs to permit thyroidectomy without risk and the dangers entailed with the use of thiouracil are thereby avoided

One hundred ninety patients with severe hyperthy nodism have now been treated pre operatively with thouraed and have gone through thy roulectomy. Both types of hyperthyroidism were represented in this grouppirmary hyperthyroidism or Graves disease and adenomatous goiter with hyperthyroidism. Response to thiouraed therapy was equally satisfactory in the two groups. When treatment was continued sufficiently long no patient failed to re pond satisfactory.

In the first 100 patients treated there were spemales and 15 males. The age varied from 11 to ,7 years the average age was 45 years Forty four patients were over 50 years of age. The average duration of the hyperthyroidism was 4 months. Almost half 43 patients had had hyperthyroidism for more than years of these 11 had been all for more than 5 years. Twenty five of the 100 patients had lost more than 40 pounds average weight to 5 king 2, pounds. The average basal metabolic rate vas +40 54 patients had mittal rates over +4

All of the patients were considered to have severe hyperthyroidism since most were in the older age group the disease was usually of long duration considerable weight loss had occurred and the basal metabolic rates were usually high Thirty five of the 190 patients were classified as thyrocardiacs. having either heart failure or auricular fibrillation without heart failure in this latter group of patients in our experience has in the past carried the highest mortality rates following thyroid surgery.

#### PLAN OF TREATMENT

For most nationts treatment is ambulatory Those with hyperthyroidism and associated heart failure or the extremely ill from hyper thyroidism alone are admitted to the hospital In the former group, combined cardiac and thiouracil treatment is begun and when car diac compensation is restored after to to 14 days these patients are discharged to carry on treatment at home. In the latter group improvement is usually sufficient after 7 to 10 days to permit continuance of treatment at Patients are advised to eat a high calorie diet three full meals a day with lunches between meals. Physical activity is slowly increased as the improvement in each nation is condition seems to warrant it some patients have been confined to bed for as long as 2 to 2 weeks at the beginning of treatment All patients those hospitalized and then dis charged and those not hospitalized are seen every 10 days to 2 weeks at the clinic or hy the referring physician for routine examina tion and white and differential blood couots If suspicious change in the blood is observed or any other to us manifestation is suggested the patient i seen more often Patients are advised as to possible toxic reactions and told to call their physician at ooce if any should occur

Thouracil is administered in a total daily does of 6 of gram 2 g pm and 3 p m 2 pm and 9 p m. This full dose is continued until the maximum benefit is obtained. At this point all hyperthyroid manifestations will have subsided with the bassi metabolic rate being ournal. The objection to reducing the dose of thouracil as improvement occurs is that the duration of treatment may be pro

longed and if the dose is reduced too rap the symptoms may actually increase to be treatment. Also discontinuing the thourist too long before thyroidectomy may perreta increase, in hyperthyroidism. Our early experience with the use of thourist tau hit that thyroidectomy should not be performed before optimum improvement is obtained stoce short of this an unsati factory ourse under anesthesia and alarming postoperative reaction may occur thereby mitigatin the complete benefit of preoperative thourist therapy.

The time required to accomplish the diable degree of improvement necessary to remit safe thyroidectomy is determined facily accurately from the height of the baul metaholic rate. It has been found that approprietally one day of treatment with of gram of thiouracil is required for each per centage of elevation in the basal metabolic For example a patient with a basel metabolic rate of +ss will require approx imately 55 days of thiouracil therapy to brun the basal metabolic rate to normal Those patients who have received Lu ol a solution before the administration of thiogracil te sponded less quickly and usually required a slightly longer period of treatment to return the metabolic rate to normal. Those patients who had had hyperthyroidism of short dura tion 2 to 3 months responded more quickly to treatment than did those who had had the disease a longer time. Those patients with very large glands responded more slowly but on the whole the size of the gland did not seem to be an important factor in the tire necessary to reduce the metabolic rate to normal With this knowledge individualized the treatment of each patient the date of readiness for operation can be accurately es timated and hospital arrangements can be made far in advance. There was no patien who was thiouracil resistant and in no cawas there failure to bring the basal metabolic rate to normal if treatment was continued sufficiently long

The average initial basal metabolic rate of the first 100 patients having thyroidetomy was +40 After an average of 57 days of treatment the average basal rate was + Three patients received thiouracal for over 100 days and 50 patients for over 50 days The average gain in weight was 12 pounds with 19 patients gaining over 20 pounds

Surgical procedures Of the total 190 na tients 177 were subjected to subtotal thyroid ectomy and 14 patients had hemithyroidec tomy Of these latter 14 patients 4 had very large gotters and it was thought at the time ol operation unwise to do a subtotal thyroid ectomy These patients were treated early in our experience before the smooth anesthesia and postoperative course of patients treated adequately with thiouracil had been observed Since thy roid toxicity is absent the time factor in the operation is no longer important so ex tremely large gland are now removed at one stage Four patients were not treated long enough with thiouracil to permit subtotal thyroidectoms without risk as indicated by an unsatisfactory anesthesia course. These cases also occurred early in our experience before optimum improvement prior to opera tion was thought essential. Live patients were prepared with thiouracil for second stage thyroidectomy the first stage having been performed following iodine preparation. One patient had only a hemithyroidectomy be cause of the extreme technical difficulty in removing a recurrent gotter. There were no postoperative deaths

When the first patients receiving thiouracil underwent thyroidectomy a most unsatisfac tory surgical complication was encountered The thyroid gland was found to be soft and fnable and bleeding of the entire operative site was so extensive that there was difficulty in keeping the field sufficiently dry to carry out the usual desired surgical technique in clu ling the isolation of the parathy roid glands and the recurrent laryngeal nerves. Since 24 000 patients with goiter have been operated upon in the surgical department of the elimie all of the surgions are familiar with all of the technical difficulties which may arise while doing a ubtotal thyroidectomy in hyper theroidem If they complain of really dis tressing technical difficulties in operating upon th se patients who have been prepared solely with thiouracil it mu t be assumed that these technical difficulties are really of serious char

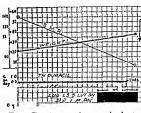


Fig. III trait e case howing combined we full thoursaid diodine properate em nageme t hyper thyr dem hoo du fitte in temporation hight funtual basalm tabol rat. Arr wild les litatibry det my Virs A. F. eed 5.3 yr. se prim try hyre thyr thousand G. dw y to times im to suse pathologic by those de by hit

acter and in no way imaginary Hemostats double books or even heatures fail to hold or pull out on the slightest traction. Oozing is almost ceaseless and 1 controlled only with the greatest patience and difficulty. It was also often impossible to do as radical a thy roidectomy as is desirable After suffering through a number of these operations it was the opinion of the operating staff that the desirable effect of thiouracil upon the basal metabolic rate was being considerably offset by the undesirable difficulties entailed in car

rying out the subtotal thyroidectomy

The friability of the thyroid gland was overcome when Lugol's solution was admin istered during the 3 week period immediately before operation For 2 weeks the iodine and thiouracil are administered simultaneously and during one week preoperatively the thiouracil is di continued and only jodine is administered The thiouracil is discontinued 1 week before operation since it has been de termined that the basal metabolic rate con times to drop even though the thiouracil is stopped It is also su pected that involution is furthered when thiouracil is not being administered Also the danger of po ible touc reactions from the drug developing at the time of operation is avoided by this plan The supplementary use of iodine preopera tively is not required in patients with adeno-

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matous gotters since this type of gland is not altered by thiouracil therapy

An example of the combined use of thouract is given in Figure 1. In this typical case with severe hyperthyroidism with a basil metabolic rate of +3,0 of gram of thiouracti was given daily for 3,4 days its administration was discontinued 1 week before operation and Lugol's solution was given daily during the 3 week properative period. The basil rate before operation was +6. The iodine given preoperatively produced firmness of the gland the palpable thrills and bruits became less marked and at operation the thyroid was sufficiently firm so that no technical difficulty was encountered.

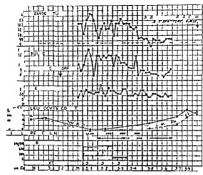
In patients adequately treated with thioura cil the pulse remains constant during anes thesia as does the blood pressure in contrast to the rising pulse rate and blood pressure in patients treated preoperatively with Lugol's solution alone No evidence of toxicity is observed the anesthesia course being that seen during the removal of a nontoxic adenomatous goster. The po toperative course is also free of reaction The worry and concern over post operative reactions have now been entirely eliminated The intensive use of sedation intravenous fluid and oxygen administration postoperatively is no longer necessary cause of these changes a revision of post operative treatment after thyroidectomy has become necessary Overtreatment with thi oursel which produces a myzedematous state

must be avoided since patients with my edema are extremely sen little to anset; a and preoperative and postoperative sedate. When patients are my redematous even small doose of sedation may suppress the respir tion and with the usual presence of muon may lead to pulmonary complications.

#### TOXIC REACTIONS DUE TO THIOURACIL

Touc manifestations (Fig ) developed in 3 patients' receiving thiouracil 18 of these being in the aforementioned group operated upon The reactions consisted of granulosities sain eruption 4 patients fature reactions 7 patients sain eruption 4 patients scleredema 2 patients and swelling of the salivary glands to patient.

Leucopenia with granulocytopenia 1 he most serious and alarming of all the reactions to thiotracii The blood changes in the q cases occurred as early as 3 days and as like of month the dose of thiotracii varying from 0.6 to 0.0 gram daily. The changes in the blood usually occurred quite suddenly with a reduction in the total white count and in the percentage of polymorphonuclear cells. The total white counts in this group were 4100 4200 4000 3800 383,0 2400 1600 1000 900 with the respective polymorphoneter count being 12 per cent 45 per cent 12 per cent 25 per cent 34 per cent 36 per cent 6 and 0 per cent not a proportionale.



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drop lour patients developed the clinical picture of agranulocytic angina 2 mild and 2 severe 1 of the latter patients died

The pat nt a woman of 41 years with severe prim ry hyperthyrodsm had rece ed the racil 6 g m d ily f r 37 days wl n she d v l ped a mild s thro t A blood count one we L b f sho da total white count f 5000 with 70 perc t px ly morph nucl rells. The thoursel was ds e nt nued he th s re thr at b gan a d sympto treatm nt s ad 1 ed Five days I ter sh dm tt I t th h si I l th city where sh th city where sh radd te th throat sympt ms had pro gre sed. The t mperature t this time was 105 d grees Th white c nt 1000 d no poly m rph n lear e ll were se n in the sm h ledth sadu i fpe clinwthadq t fill wr immel tel g nit n sly bt d th courr dafter 8 ho re

Since that experience a second case with severe granulocytopenia has been observed

mu cul dy and by n sal a d throat pray pyr d ame a d crude here et ct In 48 hours the was a decid d improvem nt in the p tient s chincal conlito. In z days the whit blood c unt hal returned to normal a d the pati nt had a subt z l thyro dectomy w th i react on

One patient with mild beginning agranulo cytic angina (1 i<sub>b.</sub> 4) having only a light systemic reaction also responded equally well to treatment with penicilin pyridoxine and folic acid. One patient had mild symptoms and recovered without treatment. The other patients who had blood changes were asymptomatic and following the discontinuance of thouracil the white blood cells returned to normal within 7 to 10 days.

This experience with the blood changes during thiouracil administration shows that the changes may occur at any time during therapy and that agranulocytosis may develop even as long as 1 week after treatment is stopped. There 1 no relationship between the production of the producti

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matous gosters since this type of gland is not altered by thiouracil therapy

An example of the combined use of thouract is given in Figure 1. In this typical case, with severe hyperthyroidism with a basal metabolic rate of +50 of gram of thouracil was given daily for 34 days its administration was discontinued 1 week before operation and Lugols solution was given daily during the 3 week preoperative period. The basal rate before operation was +6. The induced given preoperatively produced firmness of the gland the palpable thrills and bruits became less marked and at operation the thyroid was sufficiently firm so that no technical difficulty was encountered.

In patients adequately treated with thioura cil the pul e remains constant during ages thesia as does the blood pressure in contrast to the rising pulse rate and blood pressure in patients treated preoperatively with Lucol's solution alone No evidence of toxicity is observed the anesthesia course being that seen during the removal of a nontoxic adenomatous gotter The postoperative course is also free of reaction The worry and concern over post operative reactions have now been entirely eliminated. The intensive use of sedation intravenous fluid and oxygen administration postoperatively is no longer necessary. Be cause of these changes a revision of post operative treatment after thyroidectomy has become necessary Overtreatment with thi ouracil which produces a myxedematous state

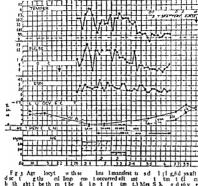
must be avoided since patients with my edema are extremely sen time to ane these and preoperative and postop, rative edati a When patients are my vedematous een small doses of sedation may suppress the resynation and with the usual presence of mucumay lead to pulmonary complications

#### TO VIC REACTIONS DUE TO THIOURACIL

Touc manifestations (Fig 2) deseloped in 3 patients' receiving thouract 18 of these being in the aforementioned group operated upon The reactions consisted of granulocytopenia 9 patients feter reactions 7 patients skin eruption 4 patients seleredems 2 patients and swelling of the salivary glands 1 patients.

Leucopenia with granulocytopenia 1 the most serious and alternang of all the restities to thiouracil. The blood changes in the 9 cases occurred as early as 2, days and as laten to 10 meters of the oracil various from of 6 to 0.0, gram daily. The changes in the 9 cases occurred as early as 2, days and as laten from of 6 to 0.0, gram daily. The changes in the blood usually occurred quite suddenly with a reduction in the total white count and in the percentage of polymorphomedear cell. The total white counts in this group were 4300 4200 4200 4200 8300 3830 2400 1600 1000 900 with the respective polymorphomedear count being 12 per cent. 43 per cent. 12 per cent. 23 per cent. 34 per cent. 36 per cent. 26 per cent. 12 per cent. 36 per cent. 36 per cent. 12 per cent. 36 per cent. 3

fr ( pr cm ) f 1 of 95 ps be f er



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Since that experience a second case with severe granulocy topenia has been observed

Fe r nd throat symptom de l ped 8 days fir d cont u g th uract Th t tal whit con nt w oos th polym nh ucl arcell in th d fire t ls (1, 3) T im tc st j flage l ses f pe cllin t n u l i tra

m c larly and by nas l and th at pray pyri d ine and crude liver extract. In 18 h urs th w s a decid d imp oweme t in the patients clic cal condition. In 1 days the white blood coint hall returned t normal a d the patint had a subtit thyro dect my with utreaction.

One patient with mild beginning agranulo cytic angina (Fig. 4) having only a slight systemic reaction also responded equally well to treatment with pentillin pyridoxine and folic acid. One patient laid mild symptoms and recovered without treatment. The other patients who had blood changes were asymptomatic and following the di-continuance of thiouracil the white blood cells returned to normal within 7 to 10 days.

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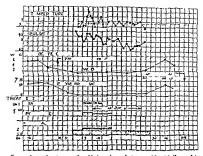


Fig 4 Agranulocyt — the bld chuncal m nil tati — Mrs M. W. ged 6 per Ad. m t u g t — with hype thyr dism. Thyroca diac. B sal m tabol rat — mual +43 for 1+9. The uracle 5d 93

the dose used and the possibility of a fatality This makes frequent blood studies essential during treatment, and careful observation and intensive therapy are necessary if agranulo cytic angus occurs Although we used other substances in the treatment of patients with agranulocytic angina penicilin was unques tionably the potent and most beneficial agent producing recovery in the 2 patients under This conclusion seems justified since it was observed that clinical improve ment resulting from sterilization of the body occurred before blood changes were noted Studies aimed at preventing the blood changes are now under way since prevention of blood changes eems essential before free use of thiouracil will be safe

Feter with severe generalized muscular aching and pain especially in the upper back and neck occurred in 7 patients. A fever of 103 degrees developed on the tenth day in 6 patients. In each of these patients the fever subsided prompily on the discontinuance of thouracil and when 0 r gram of thouracil was again administered a fever response with a return of muscular pain took place in 2 to 3 hours. One patient developed fever on the second day of treatment she also had a return

of symptoms chills fever and nausea whear repeat dose of or gram was given. Pour of these 7 patients who developed fever wer then placed on thousarbital or gramper disputed of the 4 continued taking this substance complished at which time a subtotal throst extensive was done. The fourth patient developed both fever and leucopenis follows the administration of thiobarbitals of that the treatment had to be discontinued. Further preoperative treatment in this case was carried out with Lugol's solution.

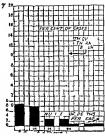
Four patients developed a severe prunit skin rash during treatment. The rash was maculopapular in type and fairly well generalized but was particularly noticeable on the arms and around the neck. It occurred on the 21st 34th 44th and 48th day of treatment. In 2 cases the drug was discontinued with prompt relief of symptoms. In both of these patients the byperthyroidentom was do enthout delay. In 2 patients the hyperthroids mas seed to without delay. In 2 patients the hyperthroids may severe enough to require intuitive treatment. In both of these the dose of thoouracil was cut to 0.3 gram a day and local skin treatment was given. The s in the

proved so that sufficient control of the hyper thyroidism could be accomplished to permit thyroidisms, without reaction. This latter experience in reducing the dose of thiouracid with resulting improvement in the skin needs further certification before this plan can be considered as the solution to the troublesome skin reaction.

In 2 patients scleredema or early scleroderma like changes were noted Both patients spoke of feeling muscle bound with the skin feeling tight. This was noted chiefly in the lace hand and upper arms where the skin was found to have lost its normal clasticity This change occurred after 66 and 70 days of treatment. In t the basal metabolic rate was - 5 and - 6 per cent with the scrum cholesterol 203 milligrams per 100 cubic cen timeters and in the second case -21 per cent with the serum cholesterol 276 mills grams per 100 cubic centimeters. The latter patient was in a mild myxedematous state as indicated by the basal metabolic rate and chol sterol determination. Neither patient showed the clinical picture of myxedema such as dry skin and swollen hids. A biopsy of the skin from the shoulder area in the second pa tient showed slight edema of the collagen fibers In both the skin condition di appeared on stopping the medication thyroidec tomy was done even belore the skin had returned to normal Excess serum accumula tion in the wound postoperatively was noted in these patients

The twenty third reaction consisted of of marked swelling of the subvary glands. This took place on the 23d day of treatment disappeared a lew days after stopping fratment and quickly returned after o 1 gram of the ourself was given. The swelling was not pain that and was only troublesome in preventing proper opening of the mouth. The patient was then given tholorubutal without towe effect until optimum control permitting the roulections was obtained.

These 23 reactions occurred in a tort of 196 patients to whom thiouracil was admin istered or 117 per cent as compared with 78 (19 per cent) reactions in a group of 405 cases taken from the literature (2) The blood changes most serious of all reactions leading

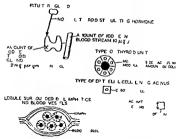


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to possible death occurred irrespective of duration of administration or dose of thourn cil given. The fever reactions except in a case occurred on the roth day of treatment and returned when a small do e was repeated. The skin cruption was variable in its occurrence from 1 to 48 days. In 2 patients reducing the dose by 50 per cent permitted continuance of treatment. The edems of the skin occurred fairly late in treatment when the metabolic rate was normal or the patient was in a mild myxedematous state. Swelling of the salivary glands on the 21st day was noted in only 1 case.

The reactions may be considered to have different mechanisms (a) Blood clumpes and skin eruption are on a toric bas. (b) fever and swelling of salmary glands are due to sensitivity (c) edema of skin results from metabolic disturbance in the skin and subcutaneous trissue.

The use of thouracil in the management of by perthyroids has permitted a great saving of hite since thyroidectomy can now be done without risk. In the last 2 years since the in troduction of thouracil there have been 3 postoperative deaths. These patients were not given thouracil but if it had been given their deaths could probably have been pretented. When it is remembered that the



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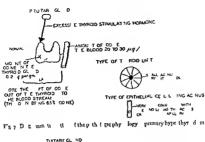
thiouracil treated patients were all severely toric and represented serious surgical risks the value of thiouracil can truly be appreciated Since the introduction of thiouracil two stage procedures have fallen from the usual 10 to 12 per cent to 3 per cent (Fig. c) No more two stage operations need be done except for technical reasons. In addition to the lessening of postoperative deaths and the reduction in multiple sta e operations a great economic saving was possible in the group of hyperthyroid patients treated since the hospital stay now is 7 to 10 days as compared with weeks when patients were prepared with Lugol's solution and the expense of multiple operations is also eliminated

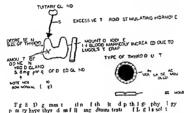
#### COMPARISON OF LUGOL 5 SOLUTION WITH THIOTIRACIL ON THYROID GLAND

Before an approach is made to an explanation of the action of thiouracil and to the combined effects of thiouracil and sodine upon the thyroid gland it may be of interest to discuss a few of the fundamental features of iodine effect upon the thyroid gland as related to its va cularity and fraibhity. These include the effects of iodine upon the histology of the thyroid gland upon metabolism and upon blood iodine as shown by blood iodine tudies. An attempt can be made to explain how thouracil operates how iodine functions the relation of iodine to thyroxin what in volution of the thyroid is and how desirable it is to obtain the combined effects of the ouracid and iodine in the patients with hyper thyroidism coming to operation

If we assume that the present conception of hyperthy rotidism is sound it is possible to illustrate diagrammatically hyperthyrodom with only one factor missing that is what in cites the eyec so if the pituitary fabrod stimulating factor. It can be shown that as the result of overstimulation of the through the result of overstimulation of the through the result of this stimulation and hyperpara there is a greater production of thy rod sent too which brings about hyperthyrodism with such diamatic chinical evidence of its effect.

upon body metabolism
a Normal thy rod pln suology is schematic
ally indicated in Figure 6. The thyroid glar'
receives stimulation from the thyroid stir
ulature hormone from the pituitary gland and
roduce is taken from the blood stream for the
production of thyroid hormone. The normal
gland contains 2 milligraims of rodine per granof dired gland and in the blood at this time
there is only 10 micrograms per cent of
sodine. The thyroid gland structure has
unit an actious which is lined with cuboxil
cells. The acmus contains a moderate arout
of well staining colloid the latter represent

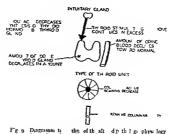




the normal stored thyroid hormone. The acim are grouped forming a lobule which is surrounded by blood vessels and lymphatics Movement of thyroid hormone to the body and manufacture of hormone with storage as colloid is dependent on the body's varying requirement for hormone

b When hyperthyroidism with its typical hyperplasia occurs it can be shown diagram matically as in Figure 7 An excess of thy road stimulating hormone causes an overactivity of the thyroid gland due to hyperplasia of the thyroid cells with increased vascularity. The lining cells of an acidus of the hyperplastic thyroid are high columnar loosely packed with crinkled edges bulging into the acinus The type of hyperplastic thyroid gland is friable and bleed profusely \ shift takes place in the jodine from the gland to the blood stream with the thyroid containing one tenth of the usual content of sodine and the blood stream two to three times its normal content

Involution of the hyperplastic hyper thyroid gland can be accomplished by the administration of Lugol's solution (Fig. 8) There is still an excess of thyroid stimulating hormone The thyroid cell reverts to an in active phase becoming flat and compact appearing to be compressed by the large amount of colloid stored in the acinus Iodine is increased in the gland up to c to 8 mills grams per gram of dried gland It is this type of actnar distention with a lessened need for an increased blood supply that makes the hyperplastic thyroid become firm so that it is no longer friable. This reduction in vas



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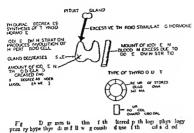
cularity of the thyroid is demonstrated by a lessening of the thrills and bruits at the superior thyroid pole following iodine administration. At operation a properly iodin uzed gland shows little bleeding and when incised is pale and relatively dry and on section the dilated actin filled with colloid are readily seen.

The exact mechanism of thiouracil ac tion still remains somewhat in doubt Certain studies suggest its action to be as shown in Figure 9 The pituitary stimulation con tinues to remain in excess. A disturbance in the synthesis of the thyroid hormone takes place and coincident with this there 1 a de crease in the iodine content of the thyroid gland A reduction in the blood jodine occurs and the blood todine level gradually returns to normal as the basal metabolic rate fall If thiouracil therapy is continued sufficiently long a normal blood iodine content is finally reached The thyroid cell still shows evidence of hyperpla ia as during active clinical hyper thyroidism This continued hyperplastic state of the thyroid following thiouracil treatment accounts for the increased vascularity of the gland Bruits and thrills are present at the superior poles together with softness of the gland and at operation excessive bleeding causes technical difficulty. If the thyroid gland is in a high state of hyperplasia at the time thiouracil treatment is beoun the hyper

plasta is increased as noted by the development of marked softness of the gland is firm spontaneously in voluted at the time of starting treatment is gland does not seem to under o great hyper plastic change. Therefore the clinical status of the thyroid gland following thiouracil treatment is dependent on the condition of the

gland when treatment is begun The fifth comparative step in the altered thyroid physiology is that which occurs fol lowing the use of combined thioutacil and sodine in preparation of the thyroid gland for its removal. Since thiouracil tend to produce a highly vascular gland an attempt at pre venting this was made by a combination of thiouracil and jodine administration. The ouracil was begun and continued up to 1 week before operation with todine bein admin istered with thiouracil during the last 2 weeks of its use and alone for a week before thy roidectomy (Fig 1) Clinically a sul stantial improvement in the gland occurred-the bruits and thrills lessened the gland seemed to be reduced in size and at operation the thyroid was adequately involuted it was not friable and bleeding could easily be controlled

Diagrammatically (Fig. 10) the pituitary stimulation is apparently still in excess with thiouracid decreasing the synthesis of thyroil hormone. The thyroid gland is till able to take up rodine when given as Lugol's solution



producing involution there being no complete block to iodine absorption. The gland seems to decrease in size and becomes firm with lessening of the bruits and thrills at the superior poles Iodine however must be administered before myzedematous levels are reached since absorption does not seem to take place at that stage of metaboli m. The iodine content of the thyroid tissue removed at operation is found to be greater following combined thiouracii and iodine treatment than following thouracil therapy alone (Fig.

An excess of iodine occurs in the blood as a result of iodine administration. Histolog ically a tendency to involution occurs but not to the degree seen with iodine treatment alone.

PATHOLOGIC OBSERVATIONS ON THYROID TIS SUE AFTER THIOURACIL ONLY AND AFTER THIOURACIL AND LUGOL'S SOLUTION

A carful pathologic study of thy rood tissue removed at operation was carried out on 77 spectmens. These patients were among the first 100 treated and include those patients treated with thourneil alone and those receiving the combined 10dine and thourneil management.

Particular attention was directed to the state of involution of the gland For a number of years we have classified the degree of involution on the basis of microscopic find ings dividing it into three stages early involution when the epithelium is still col

umnar and the colloid scanty and papillary projections present moderate involution when the epithelium is cuboidal the colloid moderate in amount and papillary projections not frequent late involution when the epi thelium is low cuboidal or flat colloid fills the acini and is usually fairly dense and homo geneous and the papillary projections are restigial At times instead of each acinus involuting more or less at an equal rate there is a mixture of the three preceding stages this is designated irregular involution. Some glands usually those with late involution may show foci which we classify as hyper involution when the Dicture almost resembles that of a colloid goiter with flat epithelium and distended acini containing much colloid the acini remain less than a low power micro scopic field in diameter as a rule the fibrou stroma is not as abundant as seen in a colloid sorter nor does it become loose and edematou as is so often the case in a colloid coiter

Varying degrees of involution may occur spontaneously in hyperplastic thyroid glands as a result of the diminution of blood supply as through pole ligation as a result of removal of a portron of the thyroid as a result of radiation or as a result of jodine administra tion. By examination of involuted glands it is not possible to state by what means the involution has occurred.

Fibrosi and lymphocytic infiltration are not essential features of involution nor of the effect of iodine or other substances admin



Fig. C mp t cases I prim ry hype thyr dim h ing odine t t I th thyr digi dif llo g thuou ci the spy at dill mb du i thur all die

istered but depend more on the age of the patient the length of time that the gland has been hyperplastic and in the case of lymphoid infiltration whether or not there exists general lymphoid hyperplasia in the patient as so often occurs with hyperthyroid; in

#### MATERIAL AND METROD

Of the 77 cases in the thiouracil treated group (Table I) 47 were classified pathologically as primary hyperplasia and 30 as secondary hyperplasia. In the few instances in which a two stage operation was per formed the second sta e pecimen was not included in the total. Twelve patients were treated with thouracil alone 13 had bodine only before the thiouracil therapy was started. The treatmanks patients all had bodine pre

TABLE 1 - TYPES OF GLAND AND TREATMENT

	Th ours J	The racult of revious out	Th surpcul respens ode	Thour I d 16- er us and p cope odin	r .		
Primary	5 .	8	20		F		
ful 1 coll d ad nomatous te					,_		
T tal							

Some type crop with glands removed at most facer on ods per of I herapy of me as rated ha. I nath has he brough bout remo I portion for the three data the fire as impos bl. In the particular of the period of the

TABLE II —STROMAL INCREASE AND LINDE INFILTRATION IN PRIMARY GLAND TREATED WITH THIOURACIL

	ldchi	2.1kg	Mos.	N M
Increased rom	3			
Lym haid not ra				

operatively a having had iodine also prort; the thiograph treatment

The ages of the patients in the primargroup varied from 1 to 77 years 51 per er; being over 40 years. In the «condary gro? the ages varied from 14 to 72 years. 77 great bears over 40 years. Six of the force group and 5 of the latter group wer mals. The analysis of the pathology of the the

The analysis of the pathology of the the ourcal treated glands resolves itself into two problems (1) What is the specific effect of any of the drug on the histologic appearant of the gland? () What effect on the in tologic evidences of activity or involution does the ourcal have? In order to analyze the two problems more clearly each will be considered separately.

#### SPECIFIC EFFECTS OF THIOURACIL

An attempt was made to determine if it was possible to say from the gro and never scopic examination that any individual specimen was from a patient treated with thio-inc. From the gross appearance there was nothing di tinctive in the size shape or con tour. In vascularity in some of the gland was accentuated a feature which was particularly noted by the surgeon at the time to operation, but it was neither constal to distinctive. The vascularity is similar to distinctive. The vascularity is similar finds removed prior to the time that preoperative addine came into use

The avera e weight of the primary byre plastic glands from patients treated with thiorracil was 28 grams per lobe. For comparison the average weight of 100 primary byreprelastic glands in cases in which inductionly was given was 4 grams per lobe. The gram difference in the average weight is of doubtful importance and certainly is insinficant as far as any individual gland 1 corrected since the lobe we that of the thousand

TABLE III -DIAGNOSES (PATHOLOGIC) ON PRIMARY GLANDS

	pe cc	De ce
mywth ly Iti	10	6
rum ry w th mod rat 1 t	6	26
rum y thit it.	4	93
m ry the gula in Iti	S	8

group varied from 6 grams to 113 grams Only one specimen was extraordinarily heavy This was from a patient treated with both thi ouracil and jodine and diagnosed as primary hyperplasia with early involution the two lobes together weighed 225 grams cases which were diagnosed as secondary hyperplasia were too variable to permit comparisons

Microscopically neither cells nor colloid appeared different in any respect from glands in the same stage of involution histologically when patients had not received thiouracil In Table II is an analysis of the amount of lymphoid infiltration and stromal increase in the glands with the diagnosis of primary hyperplasia Here again there was no uni form increase or decrease and nothing greater or less than might be expected in a control group The degree of lymphoid infiltration was somewhat greater in patients over 40 years of age. The length of time that the patient had received thiouracil or jodine made no apparent difference in the lymphoid or stromal response

#### EFFECT OF THIOURACIL ON INVOLUTION

It would be reasonable to expect from the results of the administration of thiouracil to animals that thiouracil given to thyrotoxic patients might keep the gland in a state of histologic hyperplasia and that there would be little evidence of involution in many of the glands even if iodine were given in addition It has been noted (1-3) that judine added to the diet did not prevent the thiouracil effect on animals Table III is a tabulation of the various pathologic diagnoses made on the primary hyperplastic glands when the pa tients had received thiouracil compared with a control group of 100 random primary hyper plastic glands of patients who had received only iodine Although the thiouracil treated case tend t show a higher inci lence of early

TABLE IV -DIAGNOSES ON PRIMARY GLANDS IN RELATION TO IODINE THERAPY

THIOURACIL

	Thion acl	Th outsal d previous iodin	Thioura 1 d reopera sodi	The rac l and p vi d cope a- ve lock			
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Primary on harved I vol. on			,				
P mary on h late.			,	6			
P many us h regula yel ti				3			

involution-that is there is considerable his tologic evidence of activity-there are still numerous instances of later stages of in volution

Since few patients in whom the diagnosis was primary hyperplasia had not received iodine at some time or another we must as sume that the majority of the patients showed a picture which may have been influenced in nart at least by the jodine Table IV is a tabulation of the diagnoses made on the primary hyperplastic glands according to the time that the jodine was received in relation to the thiouracil treatment and the operation Iodine did not constantly inhibit or further involution no matter when it was used

In order to determine more critically the response of the gland to thiouracil an estima tion of the histologic degree of activity of the thyroid was made in terms of basal metabolic rate points. While such estimations are only approximate in the majority of cases with primary hyperplasia they are reasonably ac curate Cases of secondary hyperplasia were not considered in this manner because of the numerous irrelevant distorting features The degree of activity thus estimated was compared with the basal metabolic rate at the beginning of thiouracil treatment. A definite

TIBLE I -HISTOLOGIC EVIDENCE OF IN VOLUTION IN PRIMARY GLANDS

	Through 1	Thou and d previou sodi	Thiourac 1 d preope odine	Thiou I d pre viou I preope odi
Admil 1 a	i -		1	6
Def [vol ion				

involutionary response was considered one m which the basal metabolic rate appeared to have dropped at least o points during the treatment. In Table \ the responses noted are tabulated. The majority of the specimens showed involution. Only three glands showed an apparent increase in histologic activity during the treatment and two of these patients had had iodine. In 40 of the 47 cases the clinical response to thouract therapy was considered good as shown by a marked fall in the hasal metabolic rate.

The degree of involution or lack of involution was not found to be dependent upon the manner in which todine was given or upon age sex duration of symptoms or duration of thouseal treatment.

Gland classified as secondary hyperplasta while more defficult to analyze in this man ner seemed to show similar involutionary changes

Since relatively form of th

Since relatively few of the patients of this series received only thiouracil as the pre operative medication the comments and discussion must be limited chiefly to observations on the effect of thiouracil nhen it is used in commencion with loading.

The effects of thiouracil alone on gland from thyrotoxic patients are seemin ly similar to the effects on glands of experimental ani mals according to the reports of Moore and associates and Williams and Clute specimens showed evidence of marked activity and with this the usual accompanying fea tures of histolo-ic activity such as increased size vascularity and height of epithelium loss of colloid small acini frequent lymphoid in filtration and so forth. However we do not believe that this thiouracil effect differs in any way from the picture seen in a hyper plastic gland in a comparable sta e of activity in which no thiouracil has been used There are no additional or pathognomonic features present in a thiouracil treated gland which may not be present in a hyperplastic gland when thiouracil has not been given. In our opinion it is not possible to examine a gland and to say from the gross or microscopic ap pearance of such a gland that the patient has had or has not had throughout treatment

In the series of Williams and Clute ( )sected specimens) and of Moore and a crates (26 resected specimens) there was parently little evidence of involution error in one case of the latter se ies In each em the nationts were treated with thione alone These results contrast with the 6 d in our series in which the majority shows evidence of involution when treated with his thiouracil and todine Rayson in comm the appearance of hiopsy specimens take prior to thiouracil treatment to the histolyne annearance of the gland in the surgical trenmen removed later concluded that in soil ; s cases there was evidence of increased activ its while in I case about the same devree of activity was evident. It would appear that while thiouracil alone infrequently cause (or allows) definite histolo ic involution in a thyrotoxic nations the addition of sodine to the treatment, either before or after the thi ouracil is administered may alter the microscopic picture considerably with many case showing good histologic involution

It is difficult to place an interpretation or these results largely because neither the cive of hyperthyroidism nor the mechanism of action of thouractl or iodine is well understood. The addition of sodine to the thouract treatment did not cause involution routinely nor as frequently as when iodine was used alone preoperatively. It was impossible to correlate the degree of histologic mobition with such factors as age sex duration of symptoms severity of symptoms or lenshift time of either thouractly or iodine thereby

It has long been known that sponlaneous remission of the symptoms of hyperthyroid-maccompanied by morphologic evidence for volution in the thyroid gland may occur. Our material derived from thyroidectomes private to the time when iodine came into general we as a method of preoperative medication showed frequent evidence of spontaneous in volution. A few patients after treatment with thiournal alone have apparently been able to discontinue the drug without recurrence of thyrotome symptoms. Perhaps the involution found in some cases is a manifestation of a spontaneous remission and is independent of the honorated freed the first production of the thoursal effect.

#### SUMMARY AND CONCLUSIONS

- Thiouracil has been proved to be a most
- aluable drug for the preoperative prepara
- 2 The drug must be administered until the naximum benefit is obtained and at that the ubtotal thyroidectomy can be carried out without risk. The dose of thiouracil used was 56 gram a day and it was found that approximately one day of treatment was required for each percentage of elevation in the basal netabolic rate Persous administration of lugol's solution prolonged treatment and hose patients with hyperthyroidsm of short luration responded more quickly
- 3 The technical difficulties at operation shich occurred in patients treated only with hiouracil have been overcome by the added ase of Lugol's solution during the 3 weekperiod immediately before operation no thisuracil is given during the week immediately before operation.
- 4 Since thiouraci cannot be given without danger—evidence of toxicity occurred in 11 per cent of patients treated—patients must be carefully observed during treatment. Granu locy topenia is the greatest potential danger so frequent blood tests are importative.
- 5 Diagrammatic comparison is attempted of the altered pathologic physiology in the thyroid gland from normal during hyper thyroidism under treatment with Lugol's solution following thiouracil and lastly with combined administration of thiouracil and Lusol's solution
- 6 The results of the study of 77 thyroid glands surgically resected from patients with hyperthyroidsm who had been treated pre operatively with thouracid are reported. I welve of the patients were treated with this ouracid alone the remainder had odine in

- addition at some stage of the course of
- 7 From the gross and microscopic examina tion of an individual gland no specific effect was found which might be attributed to thi ouracil. It was not possible to identify a thouracil treated specimen from a hyper plastic gland which has had no previous thiouracil therapy. However some thiouracil treated glands are larger than would be expected from the clinical course or microscopic nicture.
- 8 The increased vascularity of the gland noted by the surgeon in those patients treated with thiouracil is of course not apparent in pathologic material
- 9 When todine is used in conjunction with thiouracil the majority of the specimens show histologic evidence of involution especially when the microscopic picture is compared with the initial basal metabolic rate
- to The addition of iodine to the treat ment either before or after thiouracil is ad ministered did not constantly bring about histologic involution moreover the incidence of involution was not as frequent as when todine was used alone
- 11 It was not possible to correlate the de gree of histologic involution in this series with such factors as age ex duration or severity of symptoms or duration of either thiouracil or iodine therapy

## ESOPHAGOGASTROSTOMY IN THE TREATMENT OF CARDIOSPASM

O THERON CLAGETT M.D. FACS HERMAN I MOERSCH M.D. ALBERT FISCHER M.D. Rochester Min. . .

SOPHAGOGASTROSTOMY is not in tended as an initial procedure in the treatment of cardiospasm. The yest majority of patients who have cardiospasm obtain excellent results from dilatation of the cardia by means of the hydrostatic dilator. and it is only in the exceptional case that surgical intervention becomes necessary (10) It is not our nurnose to review the general subject of cardio spasm which has been very ably done in recent publ cations by Ochsner and DeBakes (11 12) Gray and Skinner and others. It would appear from a review of the literature of those cases of cardiospasm or achalasia of the esophamis in which surgical treatment was used that the hest results were obtained in the group on which esophago astrostomy was performed. Of the various surgical procedures employed in general those done through a transperitoneal approach have carried a much lower operative mortality rate than have the transpleural procedures

As was pointed out by Lambert 30 years ago and recently emphasized by Gray and Skinner dilatation of the esophagus in cardiospasm usu ally assumes one of three typical forms fusiform flash shaped or si moid shaped. In the fusiform type the lumen of the esophagus increases to a point midway between the cricoid cartilage and the cardia and then tends gradually to decrease in size in the flask shaped variety the dilatation is immediately above the cardia. In both of these types the cardia is the most dependent portion of the dilated esophagus and both can usually be relie ed by hydrostatic dilatation Cardiospasm in which the esophagus elongates as well as dilates and therefore becomes sigmoid shaped is the rarest of the three types. Here the increased length of the esophagus is accommodated by a cursed course. The most dependent point of the dilated esopharus rests on the diaphragm to the right and posterio to the cardia the esophagus then ascends to the left and enters the abdomen through the diaphragm at a hi her level A reservoir is thus formed below the le el of the cardia Gray and Skinner ha e pointed out that

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this a gulat on and this re ervoir make dilatfrom above more difficult and my m against a satisfactory result

We have recently operated on a patients cardiospasm of long standing in whose one dilatation of the cardia had faled to no. more than temporary rel ef The operation cedure employed in these a cases was ear agogastrostomy Although in each case a re good functional result was obtained the die esonhagus did not appear to reduce approud in size following operation an observation by has also been noted after esophageal dilatation

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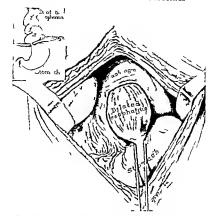
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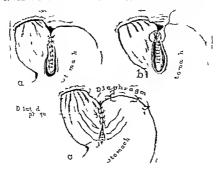
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performed through a transabdominal approach A review of the literature and our own results indicate that this is a safe procedure v hich ac complishes good results. Although good functional results are obtained one should not eertrogression in size of the dilated esophagus after

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The great majority of patients suffering from

cardio pasm can be treated successfully by hy lrostatic lilatation of the esophagus Approimitely oper cent of these patients are completely r level by one course of treatment. In 30 per ent of ca es there is a tendency for the co lition t recur Tl e recurrence may take place at any t me from immelately after treatment to as mu h as a vears afte treatment. If the conlit on does recur the great majority of patients an be ucce sfully relieve 11 y subsequent dilata ti n Dilatation of the e ophigus to means f the l dro tatic lilato can be empl ed s ith vers bittle risk. In our experience the risk has been les th no i per cent. In approximately to per e t of cases hy le tatic dilatati n does not 1 0 e ff actous and in these cases surg cal inte

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### CHONDROMALACIA OF THE PATRILLA

EDWINF CAVE MD FACS Coln I MC AUS CARTER R ROWE MD M I MC AUS I LESTER B & YEE MD C pts MC AUS Bot Mas ch tt

►HO\DROMALACIA of the natella 1 a natholo ical entit and may be a cause of internal derangement of the Lnee A Ruedin er fir t dres attention to fi me formation of the cartila e 1 the natella m o 6 and again in 1008 by reporting 15 cases in which operation had been performed. In oro Ludoff reported one case. A hausen in roto considered traums to be the etiological factor and dien at tention to the samptom, and physical signs in this condition. He advised excision of the impaired ca tila e. Aleman is credited with first usi g the term chondromalacia of the patella in 1016 Ka bon followed Aleman's nationts of a period of ears and in 040 reported additional cales The works of Aleman Karl on Slf ers old Ohermedermany and Once are the o complete in estigations of chond omalacia of the natella with follow up examinations of the major its of cales in high operations had been larged out. Their conclusions as to the pro-re-s of the disea e na be summarized a follows est phase -patellar contusion the cart la e bein fi used d phase-chondral malacia the cartilage being rated and solit by long tudinal and trans erse hs ures ad phase-degenerative chondral han e and same title

Of 1 a cons cuts eknee arthot mies ne f rmed t the 10 th General Host it I for intern I de an ement there ere o ca es ( C') in which the can e of the decapgement w found to be de ge eration of the art c lar cart la e of the patella The study i based up in the e o cases and simi lar one in which operation as done by o e of us (E F C) to ct then practice The relative fre quene of cu ren e u ests that the condition n the adolescent o the oung adult is not un common and is frequently o ethooked because (1) while the hitory is sume to e of atem 1 de ran ement of the knee the ph sical evam n t on i inconsi tent lar ely becau e f the ! ffi ult in e amin ng the arti ular su fa e f the p tella (2) the roent eno ram of the patella e tne (3) at operation adequate e pl ration of the patella frequentl not a ried out

Chondromalacus of the pat II ma b the sole cau e f symptom r ii ma b the later st es f de elopme t occated w thoth i th

ological chan es in the just. The c mmo est ociated chan es are teochondriti and to the emilion reartile es

#### PATHOLOGICAL CHANGE

The typical appearance of well a hancel ch fromalacia of the patella resembles shred follow meat The a ticular surface of the natella presea softened area. 1th multiple, triated fractions the hyaline cartila, e with particles fearthers t che lat the margin of the area (Fr ) lac case the size of the area varied from three east of an Inch in diameter to essentially the entiface of the natella. The location 1 most fee in the center of the patella (Fig. 2) but at the the changes occur at the inferior marg 1 or 1 the mestal burder. The area of soften exted do at h near the center and to arithmeners en of the area the chan as are mo e supe toal Not uncommonly small cartila nous boles an detached from the decene ated a ea nda ef f ee in the knee joi t These become roun ledan? smooth. As t me goes on these loo e bod es ma be part all or completely calcine (F 1) 1 the earl sta es chinges in the joint may remain contined e tirely t the patell b tafter m it or years as abn malf tion bet een the patel and the femur de el p the e o dars ch n es« our. The ban exare thekenin and nest of th vn in eburnation f the margins fthe femo 1 nd tibial condyles and pa tul destrition f the articular c til ge the last b ngm ! ma Led 1 the fem ral cond le here they are ontact 1 ith the glid n patella

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11.1 the s me joint. One should everet e great acre in pulpating the articular surface of the patella by diplace g it from side to s de durig the examination. Local time he assunder the patella may be the its positive finding and e en this many not be present if the pathological changes are confined to the center. I the articular surf. e It may be p sille to produce pain by pe sure it g u son over the p tella with the k ce acutely life e!

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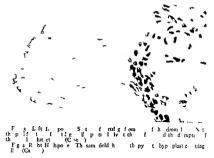
tendemess of the mestal articular surface of the patelly. It is probable that in some cases this year important is not looked for as full ignily as it in ght have been. Tendemess along the mestal knee joint line was recorded in 6 cases. The reason for his finding is not clear. In a cases the patella, as a phonormally mobile laterally.

Therefore given a patient tha history of in termittent pain wer the anterior is pect of the kinec associated with a momentary ensation of catching folloe of perhaps by slight stiffness and in derate swelling if the joint with atrophy of the thigh and tenderness along the mesial border in latitudies a face of the patiella one should trough consider the diagnosis of chondromalacia (the patiell).

A dyt d gs. In all 11 case roentgenograms of the patella ere negative. In 3 however, there as evide ce by r e tgenograms of osseous loo e bod es in the joint, hich presumably took origin from the inferior surface of the patella and in 1 case there as moderate calcification of the tibrid collateral learnest.

#### TREATMENT

The form of treatment to be employed as leter mined by the severity of the ampioms in the n dividual case.



If the symptoms are mild and cause only an oc casional disability from the knee e en thou h the diagnoss of chondromalas a of the patella may be reasonably certain operation should not be carried out until the patient has been observed ove a period of time and then only also imptoms increase mesernity. During the stime exercises to maintain strength in the quadriceps muscles should be carried out.

In a patient ith moderately severe symptoms with an occasional locking or rather frequent catching in the knee which may be followed by pain swelling and stiffness operation is probably indicated. The knees should be e-plored though a parapatellar incision and if the area of distinct grated cartilage is of moderate size complete exit on of the a ca should be carried down to home Loose e-tila nou bodies should be diffigently earther for

If an e tens we rea f chondromalae as found or ening sessually the e tire surface of the patell or if the eas marked eburnation and thicken no, of the patell, be fourth or final stage of the proce in e of two operative procedures is indicated (a) A patellaplasts to os it ig in hor zond the ect on of approximately, two-thirds of the patell with interpositio between the bons surface of the patella and fem ral ond-le of a flap if at and symona turned upward from the 1 if patell re-ion or (b) complete removal of the pitella. In all of our cale the changes in the pitella found at operation we e either moderately sevenes e.

In 9 instances the degenerated area was moved by a sharp eve sion down to lone 1 at of these there were critiagnous bodies but fire in the point which were all or removed. In 19 ft/9 some of the lone bodies were calcified. In 12 tent the change were so sever as to warmapatellaplasty. In 2 patients with associated a current lateral sippin, of the patiella the th by tubercle in each as transplanted me ally lances was the natella completely removed.

#### END-RESULTS IN IT CASES

Six pat ents ere returned to full military dath where they he remained for at least 1 year life operation. Three panie is we e returned to lin ited service duty followin operation. One has trema ned at himited ervice duty, friz month. The remaining ere returned to the Linide State be au e of chromi symon tist of the ke afte peri did of duty of frim to 5 month. The to en this setturned to school act ite. One was complet hele ed by perat a thin they was settlement to be of in the leading to the help with the size definition of the ke he pers ted of the ke he pers ted of the ke he pers ted of the ke he pers ted.

It impossible to k o the first ald poin and all of the e patie is a divent end results of the timent cannot be determined until a prodition be schaped. Therefie all of them should be flowed at earliteril to determin whether not taumatic chiges; the pot deteopt suffient degree to interfee with the multiple of the control 


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## CHANGES IN CHRONAXIE DURING DEGENERATION AND REGENERATION OF EXPERIMENTALLY PRODUCED LESIONS OF THE SCIATIC NERVE OF THE CAT

LEWIS J POLLOCK M D JAMES G GOLSETH M D and ALEX J ARIEFF M D Ch cago Illin

TO be an effective stimulus for nerve or muscle an electrical current must be of a certain liminal strength and must flow for a certain liminal duration of time As the duration of the stimulus is shortened so must the strength of the current be increased When one plots the strength of the current neces ary to produce contraction of a muscle against the durations of the current a strength duration curve is obtained. In general, it is difficult to compare the whole of such a curve obtained at one time of degeneration or regeneration with the

hole curve obtained at another time It is also difficult to compare a whole strength duration curve obtained from the examination of one per son to that of another. In part, this is due to the fact that the curve bears a certain relationship to the rl eobase or the minimal current which will timulate muscle or nerve at long durations usually over a second and frequently designated as of infinite duration. For this as vell as other reasons concerned vith the kinetics of stimulus it has been found more desirable to compare some point on a curve to a similar point on another curve. Such a point is that time constant design nated as chronaxie This is the current duration at which the strength of the current necessary to oduce contraction of muscle by a current of infinite duration (rheoba e) is doubled

Since the early work upon this time constant chronavie by Lapicque and Lucas many in estigators have contributed to its study. For the most part the studies ha e been conducted b pl vsiologists Just as it had been found that muscles which contract and relax slouls have a ger chronaxie and those which c ntract api ils have a shorter chroname so was it found th t

i en a muscle was denervated and its contra t on an I relaxation slow its chronavie increased Although the chronavie of diffe ent

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muscles of man each have a somewhat different chronavie the average chronavie of the normal muscle is a fraction of a millisecond usually less than o 5 milliseconds that for the flevor sublimis digitorum for example being o ocozi second When the muscle is denervated the chronaxie may be increased over 100 times or more

The reason for this is stated by Watts as fol The great increase in the chronavic ob served in human subjects after deners ation is due not to any alteration in the time constants of the muscle fibers but merely to the point of incidence of the stimulus shifting from nerve to muscle Since the time constant for nerve is short (0 000) second or less) and that for muscle is long (o co8 second or more) the chronaxie of the denervated muscle in which no nerve is present will be found to be quite long This marked contrast between

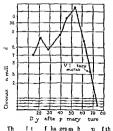
the short chronavie of the normal muscle and the long chronavie of the denervated muscle has led to the use of determination of chronaxie as a procedure for the diagnosis of the severity of a lesion of nerve and prognosis as to its recovery Many have reported upon the use of chronavie

determinations in man for diagnosis and prognos s Among them may be mentioned Bourguinon Modifications based upon the same principles

of kinetics of stimulus have likewise been used vers v dels durin World War I such modifica tion was the Lewis Jones method of using a con stant strength of voltage to determine the min imal luration at which contraction of muscle occurred

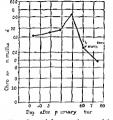
The use of these methods has not found much favor among American neurologists and neuro surgeons This is partly due to the fact that differ ent types of apparatus gave different results that in many ca es apparatus was faultily lesigned that accurate measurements of current and time could not be made by methods employing con denser disclarges and largely because of the ted ous character of the examination and time necessary

In the literature dealt g with the use of chron at e as a diagnostic and prognostic procedure in



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man it difficult to find reports of me surements performed at revular internals after injury or sature throughout the period of degeneration deneration and regeneration. Rather there is fold one measurement sometimes more of many different cases at different stages of change in mu cle. For that reason we do not have a clear understating of the e-olution of changes in choins is after deneration and during regeneration. That the enormous lengthening of the chroniave is a clear indicate in of deer questioned. A number of other questions require an answer. First what a e-the changes that in deate eco ery. Second do they antedate re



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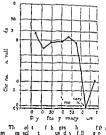


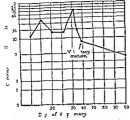
Fig Tholt flages he filter och men med teus dy fill spit felben ter

covery of motion or se sation. Third does to determination of chronaxie give as early a dia accurate indications of recovery as other methods.

To answer these quest ons we sector of a 1 immediately sutured the scatta enerol of gar i regular and frequent interv is the muscles are gradient and frequent interview in the muscles are were stimulated by square wa e currents of an guarations and strength duration curres pixed. A study of the evolution of the that are known as we say made poss ble at these three we ecompared to strength duration curres that the stands from the ex m into of dee enacted if recovering muscle in ma. As a result of the study certain a conclusions will be made.

#### METHOD

The method for obtaining an imp ise of re ta gular wa e shape last n for a little as ? microseconds has been described by us bef re (3) The duration of the impul as controll d by two gas fill d triodes o e of which sers d to initia e the flow of current while the sec d served to st? it A c astant flow of current throu h the tis ue was maintained by a pentode operated on te saturated po tion of its ch acteristic Thin three different t me interv ! selected to co ! m to a loga ithmic cale were made a ailable Te indifferent electrode placed one the heel mea ured 15 centimeters the e pl ring o e 4 m meters was pl ced o er the belly of the muscle The rheobase was determ ned b finding the theshold value of current whe the imp he lated I second Then thesh ld ales of current w " found f success els sh ter d rato s of th



Ing 4 Th | t fbage ch ma fih gas nocemus muscl t dya fil g pam ry i re fth scat

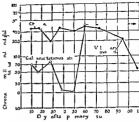
impulse. It was possible to use as much time as was necessary to observe the amperage in a suit able milliammeter by shunting the specimen out of the circuit, thereby avoiding painful unbearable stimuli and severe polarization changes.

#### RESULTS

Our fist examination was made usually from the ohi to the sth day after the primary suture. Then examinations were made from 5 to 7 days apart until motor function had well recove of 1 all of the gastrochemius muscles of the 5 cats at the 9th roth 7 sith 4th and 5th day the chron are taid lengthened from a faction of a milli second to 21 st 22 r 27 and 7 millisecond (Fig. 1 z 3 and 4). In 4 of the 5 animals the chron we continued to lengthen somewhat from 2 milli econds at the 9th day to 47 milliseconds at the 2 st day from 3 millisecond at the 10th day to 48 milliseconds at the 5 st day from 4 milliseconds at the 5 st day from 4 millisecond at the 10th day to 48 milliseconds at the 10th day to 48 millisecond at the 10th day to 48 millise

35 milliseconds at the 19th day from 21 milliseconds at the 15th day to 24 milliseco is at the 27th day an liftom 7 millise ond at the 4th lay to 15 miles onds at the 21st day.

Tien n 4 of the 5 namals the e vas slotten ng of the chronave from 4, mill second is the 21st day to 26 millisecond at th 3 st lax fr m 55 millisecond sat the 35 millisecond sat the 15 millisecond at the 15 millisecond at the 12st day and 15 millisecond sat the 12st day and 15 millisecond sat the 15t day to \$1 S millise on 15 at the 21st day and 15 millisecond sat the 15t day to \$1 S millise on 15 at the 21st day and 15 millisecond sat the 15t day to \$1 S millise on 15 at the 21st day 15t 
This hartening in chronaxe at times to one half of that preent before is of course not an rication of recovery. That a harter g of it are course at this time during the tale of



degeneration of the muscle should be emphasized and remembered. The shortening of chronauc oc curs about the same time as we have found a tem porary, nse in the rheobase in threshold and ratio for progressive current stimuli and thre hold and ratio for galvanic telanus to occur. The cause for these change is as 5 yet unknown (Fig. 5).

Following this there is a progressive lengthening of othern the to a peak which a as reached at the 49th 49th 53rd 53rd and both 40sy with a chr navie of 56 milliseconds 23 millisecond 60 mill seconds 72 milliseconds and 38 mill seconds respectively.

Once the peak of the lengthened chronave had been rasched and as the result of regeneration began and continued to sho ten the shortening process was rapit and of a consideral le order. The answer to the question as to whether such a rapid and significant shortening of chronaxie occurred or earlier than signs leterted by other methods of electrical examination was made possible by de layed recovery on not of the cats. The delay was found to be used a large neuronar when the opera to exite the sequence of the cats of

In the lase the chronave had lengthene to a misseon is on the total bay after primary state. On the 17th day 17th as 35 millisecond an 1 th n it shorteard to ao milliseconds on the 27th day. On the 37th day it had again lengthened to 35 milliseconds and continued bettern 3t and 1 77 milliseconds and the 72d day 0 mthe 931 dat it shorteard to 20 millisecon is and on the 68th had not was there a sharp a fortein g to 56 milliseconds.

seconds. Even if the lesser degree of shortening in the chronaxie at the gold day be taken as an indication of recovery. It can be seen from Figure 9 that at the 60th day the large galvanic tetanus ratio predicted recovery which was confirmed by return of active motion on the ro8th day. Thus the large increase of galvanic tetanus ratio predicting recovery which was confirmed by the first producing recovery of galvanic tetanus ratio predicting recovery of galvanic tetanus and galvanic tetanus and galvanic tetanus ratio predicting recovery of galvanic tetanus ratio predicting recovery of galvanic tetanus ratio predicting ratio predicting recovery of galvanic tetanus ratio predicting ratio predicting recovery of galvanic tetanus ratio predicting ratio pre

In man we have also found that the increase of threshold for galaxine tetanus and of tetanus ratio as well as the increase of threshold for prooreesive current and progressive current ratio indicating successful regeneration of a nerve pe ceded the supplicant shorte into of chronave in

dicative of reco ery

We have already called attention to the fact that discontinuities in the strength duration curves which are indicative of regeneration of a nerve may be seen during the time that chronarie may continue to lengthen and seem to give indi eation of continuation of the degeneration of the muscle. In a group of spontaneously re ovening peripheral nerve injuries in man, the number of instances in which the chrona ie had significantly shortened (15 milliseconds or less) was about the same as those in which the calvanic tetanus ratio was high. However at times the galvanic tetanus ratio was low and the chronaxie short. At other times the chronaxie was long and the galvanic tetanus ratio high. When evidence of some denervated muscle was obtained by a low galvanic tetanus ratio and in the same muscle e idence of some neurotized muscle was shown by a short chronasie the combination gave excellent indi cation of a spontaneously recovering nerve

When however a nerve had been operated upon a considerable time before electrical examination was made whether mot on or sensation had recovered onto the number of instances of high galvane tetanus ratio exceeded those in 1 h chronaxie had shortened. Nevertheless in some a low galvanie tetanus rat o and a short chronaxie undicated recovery

It is obvious therefore that it is of value to measure the chronave as well as the gal and tetanus atio

#### SUMMARY

The marked lengthenin of chronavie from th t of a fraction of a millisecond in normal muscle to one of 100 or more times sindicate of a dener ated muscle After the initial marked lengthening

of chronaxic following section and so tone i. nerve the temporary shortening of thesis which occurs at about the 26th day must reinterpreted as a sign of recovery It is a pleenon which occurs at a time when other this m characteristics of responses to dectical trans usually seen at recovery also appear for a d time These are the increase in rheolase morn threshold for gal an c tetanus and of tetan an tio increase of threshold for progress t or stimuli and progressive current ratio Theca e this is and nown When one then follows the nottion of changes in chronaxie it is found it stomificant shortening of chronavie is associa with reco ers. However when reco en is d laved this occurs much later than other ind a tions of reco ery derived from other method of electrodiagnosis Even when not delived when regeneration of a nerve is progressing other ser precede sho ten pg of chrona ie as an ind atool reco era However the comb nation of ale gal anic tetanus ratio with a short chrona e w characteristic of nontaneously recovering less and at times of reco ery after operations are in mired nerves

#### CONCUE TONS

r The marked lengthening of chronaue fros that of a fr ction of a millisecond to that ion or more times longer is a clear indication of dr evated muscle

2 The temporary shortening of chronasied a

sign of reco ery
3 Significantly great shortening of ch maxe

from its final peak of great length is a sign of n co er.

4 This s gn of recovery occurs later than a great

4 This s gn of recovery occurs later than it is derived from other electrical elaminations is a setanus ratio and may not occur utline treco eri is present.

5 The combination of a low galvanic teta-1 ratio with a short chronaxie is characters at spontaneously recovering lesions and at times of recovery after operations upon injured nerve

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P n Mass 1 93,
1 T rs L r P n R Soc M Ls d 9,1 r
2 L rs L C R Soc E 1 95 to 8,8
4 L c A h rm J f hys 1 Ls d 96,4 4 3,
5 r Gyn Obst 9,4 7 13
8 r Gyn Obst 9,4 7 13
8 r Gyn Obst 9,4 7 3 13

#### EXPERIMENTAL CHOLECUSTITIS

#### Final Results of Vaccine and Filtrate Therapy

MARTINE REHFUSS M.D. nd GUY M NELSON M.D. Ph.l delph a Pennsylvan

> a tabular review of the literature on chole cystitis (2) the bacterial studies on 2162 diseased gall bladders removed at operation seemed to indicate that the organisms most frequently present were streptococci similar to those infecting the nose throat teeth and bowel the Staphylococcus aureus as in sinus disease and members of the typhoid colon group Our experiments conducted over a 15 year period were carried out with over one hundred antigens obtained from patients in the Jefferson Hospital In the first series in which 16 strains of different types of organisms were injected into 88 rabbits some degree of chronic cholecy stitis was produced with organisms from each group the mo t effec tive being a nonhemolytic streptococcus isolated from the bowel of a patient suffering from chronic cholecy stitis and colitis Inoculation of 66 of the 88 rabbits with the nonhemolytic streptococcus caused gall bladder disease in 13 (20 per cent) In a later communication (1) on the use of various bacterial organisms it is reported that 44 strains of 7 different types of organisms ere used in 129 rabbits resulting in 25 d seased gall bladders (approximately 20 per cent)

Ascending closes were injected intra-enously into the rabbits earn usually beginning with oo cubic centimeter of 6 bour culture and repeated in larger closes once or twice a week dependent upon igns of morbidity in the animal. Frequently injections were discontinued after the third or fourth small dose but in other cases the third or fourth small dose but in other cases the dose amounted to 3 cubic centimeters of a 2 hour culture. Realizing that in some cases we had used too large amounts of the antigen which tended to prod to acute rather than chronic cholecy stills we deceded to modify the technique

While aware of the virtual impossibility of duplicating in the experiment I animal focal in fection as it may exist in man nevertheless we hoped to simulate this condition as clovely spossible. Therefore small intraven us impectus of ozor to ogo cube centimeter of an 18 to 24 hour culture were repeated twice a week unless contradicated by the condition of the rabbit (1). One of cated by the condition of the rabbit (1).

hundred sixty six animals were injected with the viable strain of Streptococcus nonhemolyticus (antigen 7) until presumably, chronic illness was clinically evident. Eighty four diseased gall blad ders (5x per cent) were obtained.

The animals were then segregated into groups of 3 individuals control vaccine treated and filtrate treated the selections being based on similarity of response to the culture inoculation—the temperature and weight changes and presence of joint disease. (With the nonhemoly tie streption coccus we have observed a high incidence of joint disease associated with gail bladder lessons). When it was impossible to select 3 animals with similar manifestations those in the poorest condition were placed in the control group. On this basis 50 were retained as controls 50 were inoculated with facctine and 57 were treated with filtrated with

These series were further subdivided according to the nature of the detain regimen (adequate in some cases and inadequate in others) and the results obtained led in so believe that the animation an inadequate det responded less favorably to treatment than did those which were adequately fed Furthermore the treatment with autogenous vaccine apparently vielded more satisfactor results than did treatment with the filtram.

Since then we have employed the same metl od of experimentation on a further series of 224 ani mals with this exception. After completion of the infective phase the animals were arbitrarily e lected for grouping as follows-t sad t the rabbit apparently in the best physical condition was placed among the controls and that in the poorest among the vaccine treated triad 2 the poorest animal was placed among the controls and the best in the vaccine treated tread 3 the healthiest animal was selected for the fitrate treated group the poorest for the controls Employing this pro cedure for each selection of 3 the best and poorest animals were evenly distributed throughout the 3 groups In this w we felt we had avoided preju dice in the selection of animals for treatment

We shall present here a detailed interpretation of the data obtained by gross studies at necropsy on the 224 animals (,4 control 75 vaccine treated and 75 filtrate treated) that lived maintained on an adequate diet throughout the planned term of

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TABLE I —GROSS PATHOLOGY AS OCIATED WITH
GALL BLADDER DISEASE

	SERIES OF 2 4 ANIMALS	ANTIGE	٠,
		\ mbe	Pic
	Il bl dd les na gr t tal	3	63 1
	llb!dd di ased bil rm l	86	39 4
G	il bi dd dise sed bil b me l	67	99
	libldd disea ed t t	-	, ,
	disease	8	3
G	ll bl dd d: ased th		-
G	thd yl ns Ilbldd drased th		9 4
	ti tls	•	46
G	Il bl dd diseased with oe t t	-	• • •
	and ditt		

treatment The 11 cott 1 6 acc ne treated and 14 nitrate treated rabb ts Inch either died or were killed to prevent postmortem change when death seemed imminent a e not included in this report because autopsy di closed that their suffered for the most part from an acute bacterial infection. The fect that so few an mall died after initiation of the treatment phase of the experiment is perhaps indicative of our uccess in selecting the chronic cases on the ba 1 of clinical evidence.

Microscop c studies on thi ser es will be re po ted later. Nine normal an mal selected from the same stock showed no evidence of gross or

microscopic change at necrops

Table I summatizes the g oss patholo c find firs on the gall bladder ob en ed at necrops on the 4 animals It is to be noted that appro i mately one third of those with cholecystic disease showed coe sitent kidnes and joint infection El ewhere we shall pre ent the studies on asso cated lesions.

Table II gives general findings on bacteriological study of cultures reco ered during ne opsy

Only 37 or 16 5 per cent of the minals had an active infect in and in ol. 20 o 8 5 per cent was the viable Steptococcus nonhemolyticus present in the bile. At first glance it may be thought that the reco ery of the organism from the joints closely prailleds that from the bile. However, it must be borne in mind that only 13 rabbits § 8 per cent disclosed some active mice tion of the joints on necrops. The emaining 3 joint cultures we e from rabb its has ing multiplionit infection. It is app cut the refo e that in both gail bladder less ons ind core stent joint and kidney lessons the organs we e frequently sterile.

## FURTHER DATA ON CULTURE INJECTION —VIABLE ORGANISM —2 4 ANIMALS

In the control group 1th adequate d et the e e e 74 animals Th total numb of njections

### TABLE II - POSITIVE CULTURE RECOURSE

An an 1 th Ttal postu lt	11	es	37	Perme 15
Bl cult esf m J t cult f m kdn yo 1		m	203 6	1 1
Oth so h	es f	-	0	+5

given was 1301 the average injections number; 18 The period of injections covered a moral of 3 day to a maximum of 8 months. Therapper of injections was 1 to 58

In the vacci e treated group with adera duet there were 75 animals with an area enber of inject ons of 18. The total number of injections was 1357. The time range of injections was 1357. The time range of injection in the series vaned from 3 days to 31 mea. The ran e of number of injections was 10 st.

In the filtrate treated group with adequated there were 5 animals with an avera enumber dispections of 10. The total number of injections (as more than t was 14.0. The time ra ge of injections (we more than t was given) varied from J days tog months. The range of number of injections was 14.0.

#### DURATION OF CONTROL PERIOD

Of 74 animals 48 were controls for 3 months
14 were co t ols from 2 to 2/months 5 were
control from 3 to 5 months 7 were co 1 1
for a months

In only 2 8 9 per cent of the 224 animals jected with the viable antigen was the 0 ga 1 m covered from the b le. It is therefore apparent that some time after the pe 10d of administrat ecovery of the 0r anism was relatively infrence t

After preliminary injection of the vabl of ganism and an approp at rest period the second group was a bmitted to val e treatment a follows:

#### 1 come T atment

Adequate Diet Planned Period-224 animal In the group of 35 rabbits receiv g small 4 s ages o recei ed 26 or 27 treatments to recei el 17 to 25t eatments 6 ece ved 28 to 35 tre tm at Twenty three were t eated over a period of 3 months 9 were t eated from 2 to 'mo the 1 se treated 3/ to 4/ months The number killed organisms given was as follows 19 rece to single do es of 30 000 or 135 000 killed orga. 1 ms 9 rece ved ingle doses of 33 000 to 57 000 Lill d organi ms 3 eceived single doses of 120 000 or 125 000 killed orga isms 4 rece ed single does of 140 000 to 189 000 killed o ga isms A general 000 organisms per treatment was a erage f given

TABLE HI - SIMMARY OF INCIDENCE OF CHOLICISTITIS AND COENISTENT LESIONS

Con rol						٠,	ci.		FI				
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Ques to 11 bladd h jo d ans lessons Pos 11 bladder h jos d ns lesson		¦ -	۱ –			6	[ -	-	1	-	-	-	

In the group of 40 rabbits receiving 1 see around glossing preceived either 30 or 30 do es 7 received 14 to 17 doses 6 received 3 to 25 de 86 received 13 or 25 doses received 4,5 or 36 doses or a general average of 30 doses Treent 4,5 or 30 doses or 30 doses Treent 4,5 or 30 doses or 30 doses Treent 4,5 or 30 doses 1

The third group was submitte I to tilt are treat ment as follows

## Fili at Teat er i

In the group of 40 rabbits g e nall do ags 5 received 21 to 30 loses 73 received 22 to 30 loses 73 received 22 to 32 loses 1 to received treatment for 3m niths oreceived treatment for 1 months Tleam unt of firm eight was 3 received from 5 to 35 cult c et met ts

11 received 0 60 to 1 05 cubic centimeters 6 received 1 40 of 1 45 cubic centimeters

It the group of 35 rabbits given large o ascend do get spreened 20 or 29 treatments 11 received 14 to 25 treatments 4 received 48 or 19 treatments Twenty six r cenvel treatments and 1 received 33 or 19 treatments Twenty six r cenvel treatment for 3 months 8 received treatment for 5 months 1 received treatment for 5 months The amount of hitrate given means as follows 14 received from 2 75 to 30 or cubic centimeters 13 received from 2 50 to 36 gubbe continueters 7 received from 5 30 to 56 gubbe continueters and 1 received 14 46 cubic centimeters

TABLE IN -GRADES OF GROSS GALL BLADDER LESIONS OBSERVED

6 1	_ C	1 e	_ \_		F	1
	1	1 "	1	~	1	e.
N .	1	3	7 1		1	277
Mos-as us	73	1	1	20		-
Plus	. 29	1	17		-	29
Pios	-				1-	
PI					-	

TABLE \ -INCIDENCE OF CHOLECISTITIS WITH COFNICTENT LEGION.

CHARLEST THE WITH COEXISTENT LESIONS																
	_								Fin						44.	
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due e or with 11 bit dd	-	-	-			5	1 1	-	-	-	-	-	3	5 -	-	_
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Fes galibladd with to d	1	°		~		- 1	-	_	-		-	_	-	-	}_}	

To ascertain the effect of treatment upon the patholo repicture the data used to p epare Table I were appropriately distributed among the respective groups of 4 control 75 vaccine treated and 75 filtrate treated annuals (Table III)

Secropss of many hund ed of healths rabbits killed to obtain material fo physiological and chemical studies has given us an indelible nicture of the healthy gall bladder in the rabbit Likewise our experience with the experimental production of cholecystitis has taught us how to recomize grossly an unmistakahly pathologic gall bladder However on some occasions during these experi ments necropsy revealed gall bladders that were not definitely nathologic vet on the b sis of our experience with normal gall bladders we were not justified in considering them negative. There were de nations from the normal, but the changes were too slight to characterize the organs as definitely diseased. In such cases we decided to re cord the observations as plus-minus that is the condit on was intermediate between the normal and that clearly h wing low grade pathology Study of Table III discloses the the question ble plus-minus gall bladders furn sh the cruc al data when we seek to determine the efficacy of treatment in reducing the inc dence of chol cystitis. If we consider the plus minus les as a belonging to the positive gro p then themod et of desase among the controls to fop ercent in the vaccine treated aimmals 6a per cent and mit vaccine treated aimmals 6a per cent and mit vaccine treated aimmals 6a per cent and mit vaccine. These differences a frequency are too small to be of any orthy tigal cance. On the other hand if the plus-minus gall bladder lessons are not considered them the court cancer of definitely positive gall bladder lessons in the control group is 6a per cent while for autogenous vaccine treated group is 44 per cent and for the filtrate treated group of 4e per cent.

V come treatment therefore presumably lo ered the incidence of gall bladder disease by 21 per cent

In regard to this difference it is i terris gio unto that a oper cent of the vaccine treated as male is hibited doubtf | o plus mins gill bidder dosses while only a per cent of the cotrols and 8 per cent of the filtrate treated an mily and plus-minins gall bidderle less ons. It is a q er tion whether the observation | doubtf | that great the terms atto of treatment signifies that the lessons we e in a state of involution or h ta er to low grade milection w pers stent throughout the period of e-perimentation. In lew | fine low per centage of d butful gall bidder lessons amo 8

TABLE VI - RFLATION OF GRADE OF CALLBLADDER LESION TO METHODS OF TREATMENT

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C d f onslesso	R.	epea ed all doses animal	Asoen	क क्षेत्रस्य क	R	rpe ted all doses ammal	Asc di g doses 3 animals		
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Plus m		7	6		4.			57	
Phys			1	5		37	7_	20	
n	1 6	_		30	1	3	1	3.4	
Plus 1			1	5	1	5		57	
Ttald fi les	_	$\overline{}$	1	4 5	1		20	57	
Tox lof liles i 1 d d fine d	-	1	1		1	80		6	

the controls we feel that the evidence points more strongly to the assumption that these were in process of involution

Failure with the filtrate treatment may be ascribed either to inadequate dosage or to in ability of the viable organism to elaborate a potent evotorin

Table IV is a frequency distribution of the various grades of gall bladder disease observed in the 3 groups (control vaccine treated and filtrate treated animals).

Comparison of the control and vaccine treated.

groups discloses (c) that there were 5 per cent more negative guil bladders in the vaccine group (s) there were 124 per cent fewer middle positive plus 1) gall bladder lessons in the vaccine according to the vaccine for the vaccine for the vaccine for the vaccine group. The incidence of severe (plus 3) gall bladder lessons were too few to lend themselves readily to interpretation. Yet if one adds the 5 per cent difference in the incidence of negative gall bladders in the control and vaccine groups to the 10 per cent difference in the doubtful lessons for the control and vaccine groups to the 10 per cent difference in the doubtful lessons for the control and vaccine groups to

negative group there was a difference in percent ages of control and vaccine of 5 per cent in the plus-munds group of 16 per cent or a total in these groups of 2 per cent I in the plus 1 group the difference was 12.4 per cent in the plus 2 group the difference was 3 oper cent in the plus 3 group the difference was 3 oper cent or a total 1 20 7 per cent in the latter 3 groups.

sum equals the sum of the respective differences in plus 1 plus 2 and plus 3 lesions of the control and vaccine treated gall bladders e.g. in the

Repeated small doses and ascending doses were employed in order to evaluate the merits of the two methods of treatment. The data obtained with the respective groups after the mall and

the ascending doses were used are presented in Table V. Here again evaluation of the improve ment in the gall bladder lesion depends upon what significance is to be placed upon the doubt ful lesions.

The frequency of the respective grades of gall bladder lesion in relation to the mode of dosage with vaccine or filtrate is presented in Table VI an extension of Table IV

The total positive culture recovery of the control vaccine treated and filtrate treated groups is given in Table VII

In Table VIII the incidence of various grades of gross gall bladder lesions observed at necrops, is compared with the number of injections of viable antigen 7 (Streptococcus nonhemolyticus) given during the infective phase of the experiment

The question may be raised as to whether the nurobet of injections (amount of viable culture) given eventually determines the degree of gall bladder lesion produced. To ascertain accurately the effect of a number of injections an equal num.

TABLE VII -TOTAL POSITIVE CULTURE RECOVERY

Kou	,00	Co !		rccs	F1 75 m l			
	1	6"	1	e+	1	P7		
Anumala wash pos cul re	5	20	8	1		8 7		
G !! bladde wall bil	1	5		67	8	7		
Bd	6							
J	Τ-	1	1	7	1-			
Live	1	_	-	1	1-	_		
Kidney		1	1-	<del></del>	1-1			
Lrin		-		-	-			
Cys m tall	1	-	1-	-	J			
Tot loss vecul								

TABLE VIII —PREQUENCY OF VARIOUS GRADES
OF GROSS GALL BLADDER LESIONS
NUMBER OF INJECTIONS OF MABLE ANTIGEN

0	7 (	T				
	( p	/egs	Plus I us	Pos ve		Pos ve
	ţa.	1	8		۰۰	3
		3		_		
_		8	1			_
3				4		_
_				- +		
_	60	1				
	Adh	nal animal	b b II	bladd as	e rutali	bee

ber of animals should have been used for each range of inject ons which unfortunately was not done. Table III shows for ear night that only 8 rabbits received injections in the ran e of 51 to 60 while or rabbits received injections in the ran e of 51 to 60 while or rabbits received injections in the range from 1 to 10. Since the average number of injections of culture given in our experiments a 18 for each group it is not surprising that 146 (65 per each) of the attimular received injections in the 1 to or range. Howe er se ere, (plus 3) le ions were not found in any group when more than 30 in

jections of the viable antigen vere given. The average life expectancy for a rabbit is about 6 vears (12 weeks). The period of inocula iton with antigen 7 averaged in weeks or 1/30 (10/3) of a rabbit s life. With 60 years as the file expectancy of man, then by direct comparison the human being would have been subject to an active infection for years. Most of the rabb its received vaccine or filtrate for 3 months or 1/6 of (1/3) of their lives. For it I human subject this period of treatment would be comparable to

#### 3 years conclusions

r A final survey is presented of experimental cholecystiti produced in rabbits by the intra venous injection of a viable strain of rower streptococcus originally obtained for a r r suffering from cholecustiti and cold

2 After an initial period of morelative the viable organism and a subsequent rist (era, the animals were di ided into 3 groups of the animals were di ided into 3 groups of the animals were distributed and the second to a elevancime and the third with a filtrate prefrom the same organi m

3 By the use of a modified technique the a dence of cholecy stiti was increased in this see

to 68 per cent

4 The gross findings at necropsic erech e as (a) doubtful (b) plus 1 (c) plus 2 and (1) 1 a 3 Any difference observable was in fa or of t animals who received vaccine treatment Oils ontrol group 64 7 per cent nere den telv pe tive and a r per cent doubtful of the view group 44 per cent were posti e and doubtful and of the filtrate group 64 per or were positive and 8 per cent doubtful. The obsevation of doubtful les ons at the termin ton a treatment may signify a state of involutio or L persistence of a low grade infection. In view of the small percentage of doubtful gall blad lessons among the controls we feel th t the n dence favors the assumption that the doubtil lesions were unde goin involution. The topositive cultu e recovery was a some hat lo re

number
5 On the other hand in a ge eral survey the
evidence of gall bladder damage as marked
constant in all three groups attesting to that
that the viable or gains in was re-possible for
than exposed or or merce or
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construction.

#### REFERENCES

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## **EDITORIALS**

# SURGERY Gynecology and Obstetrics

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OCTOBER 1945

## MISUSE OF MORPHINE AS A THERAPFULIC AGENT

"A anyhody a list of the drugs that are most useful in medicine morphine would be placed near the top Misuse of the agent that may have occurred in military medicine only points to a imilar although perhaps less noticiable abuse in private practice for military medicine during wartime repre ents a cross section of civilian medicine Both pharmacologists and clini ian say that the misuse of morphine is not to be placed at their re pective doors. Where the re ponsi bility lie for the unwise employment of this ag nt is k s important than the fact. It is to be r cognize I too that here is one more exam pl of the regr ttable state into which the teaching of therapeuties has fallen. The situ atin i a paradoxical one in that medical chool and ho pital whose aim is to provide a I ackground which will permit the tudent to understan I the treatment of disease often fail to ac omplish this reasonable end lea t they fail have failed in the present in

stance to ensure the sensible use of the most

Aside from the fact that adequate teaching of therapeutics does not exist in many medical centers the causes of morphine overdosage (for its misuse is chiefly that) are several

There is failure to appreciate that nearly the safe maximum analgetic effect of mor phine can be produced by 15 milligrams (gr 1/4) and that 30 milligrams (gr 1/2) can produce serious depression in small individuals or in any individuals whose tolerance may have been lessened by wounds particularly those associated with hemorrhage or pneumo thorax or other disability that limits the in take and distribution of oxygen. In civil life everybody practically knows that morphine is contraindicated in hypothyroidism and is dangerous in obstetrics. Too few know that impaired liver function increases the danger that an otherwise modest do e may become an overdose in a given case

Failure to realize that subcutaneou in sorting of merchine will be only poorly also sorbed if at all when the purpheral circulation is luggish or inactive as a result of cold or low systemic blood pressure has led to rather frequent trouble. I ailure to get pain relief from the unabsorbed monthine leads to the administration of a second or thind does all of which may be ab other lat one time when the peripheral circulation is reestablished as a result of resuscitative measures.

The incorrect behef that extensive wounds are inevitably associated with severe pain often leads to needle suse of morphine. At Anno only a quarter of the severely wounded patients and in response to a direct question.

that they were having enough pain to want pain relief medication. This was in one of the most forward hospitals and these patients had not had morphine for seven hours on the average.

The administration of morphine for conditions that will not respond satisfactorily to the agent however large the dose is a common error. Specifically the use of morphine to treat the resilessness associated with bleed ing with anous or with hysteria cannot be soundly defended. The use of morphine in shock except for the treatment of severe pain is contraindicated, it produces sweating it causes nause and vomiting. Thus it not only increases fluid loss but makes the intake of fluids by mouth and their retention often impossible.

Morphine is occasionally administered where other agents (barbiturate sedation for example) are far better as in the treatment of neriousness the jutters sleeplessness Individuals with these problems are of course likely candidates for addiction. The use of morphine as a routine in preanesthetic medication is difficult to justify for there is reason to believe that the patient pays too high a price for the depression obtained by means of this agent and that the effect desired could be achieved better in other and se

The evidence is mounting that morphine has a single legitimate use the relief of severe pain—a widely accepted view but one too little put into practice

HENRI K BERCHER

HENRY K BEECHER
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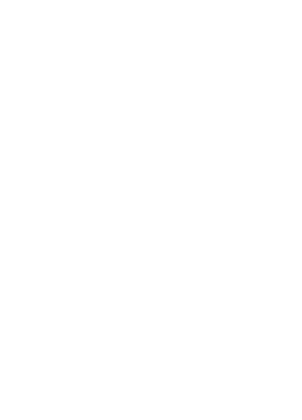
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The Relationship of Chrome Le ions to Caremorna of the Colon-Chrome Ulcerative Coliti DAVID H LYNN M D Detroit Michigan

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ABSTRACTS OF CU	JR	RENT LITERATURE	
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# INTERNATIONAL ABSTRACT OF SURGERY

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# THE RELATIONSHIP OF CHRONIC LESIONS TO CARCINOMA OF THE COLON—CHRONIC ULCERATIVE COLITIS

#### Collective Review

DAVID H LYNN M D D troit Mich g n

UPING the past decade the results of surgical management of carcinoma of the large bowel have improved dra matically and the application of tech mical advances has greatly reduced the hazards which too often followed resections of the colon Now that malignant lesions of the colon in expert hands can be treated in such a manner as to offer a more favorable pro nosis to the patient it is our duty to improve the clinical results further through efforts directed at earlier recognition of the cancer As a step toward this objective we may learn some facts from a careful analysis of our knowledge regardin those liseases of the colon that may have a prefatory relationship to colonic cancer one being chronic ulcerative colitis

In order that the extent of this review may be kept within bound the literature of the last ten years only has been made only when necessary and wien the reason for their citation is evident

At the outset it may be stated that althou ha have appeared [7, 8, 11, 14, 16, 19, 21, 73, 39, 51] during the past decade our knowledge in this feld has not been greatly extended eithe by the addition of new material or by significant indimental discoveries

A review of the recent hterature on chronic ulcerative col its demonstrates the controversial status of all aspects of the subject In 1939 Willard (62) wrote of chronic ulcerative coluin

If the two recognized entitles tuberculous coli its and amebiasis be omitted from discussion there is no agreement as to classification etiology natural history prognosis or treatment of this symptom complex Six Sears hiter 17 1946. Willard's statement is certainly just as valid as it

was when first made. There are a number of theories regarding the cause of this dis ase and the authors are proponents of the several ideas these have been summarized in Table I.

The data assembled in this table present con vincing evidence of the meagerness of our knowl edge re arding the exact etiology of chronic ulcer ative colitis. Notwithstanding the fact that even during recent years many students have carried on extensive investigations of the problem there is still no unanimity of opinion Possibly this is true because in the past all of the chronic pleers tive diseases of the large bowel except those due to tuberculosis amebiasis and carcinoma have been grouped comprehensively together under the term chronic ulcerative cohtis However the present tendency is in the opposite direction and as a result of more experience there is an inclina tion to define the disease entities within the com posite group more price ely Thus in 1941 Bargen (7) pointed out that chronic ulcerative colitis as it is known today is probably a syndrome con sisting of numerous disease entities Apparently the resolution of this phase of the general problem is still progressing in the same direction Le cause more recently in 1944 Bargen (8) states

There are many varieties of ulcerative enterocolusts. One cannot emphasize too strongly the importance of establishing as nearly as possible the nature and cause of a given case. He now recommes the following seven disease conditions that are characterized by varying degrees and types of chronic ulceration of the colon

r Streptococcal ulcerative colitis (also referred to as non-pecific or idiopathic ulcerative colitis and sometimes as colitis gravis and thromboulcerative colitis)

TABLE L-THEORIES ON THE ETIOLOGY OF CHRONIC ULCERATIVE COLUMN

Ge rai Type I E logy	P rt cular Causa ve Age Fac	A the Prope t
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2 Amebic ulcerative colitis

3 Ulcerative colitis due to the virus of venereal lymphogramuloma

- 4 Regional ulcerative colitis (cause not clear) 5 Regional ileitis
- 6 Tuherculous ileocolitis
- 7 Other intestinal conditions
- (a) Chronic bac Hary dysentery
- (h) Ulcerative colitis of unknown cause
  - (c) A deficiency syndrome

(d) Allergic colitis

In the study of the relationship of this syn drome to carcinoma of the colon information regarding the etiolog of chronic ulcerative colitis has a double interest. First of all since most previous reports in the literature have not clearly differentiated particular disease entit es and since a number of etiological agents and factors appear to be involved it is unlikely that from an analysis of reco ded data we should d scover a kinship of cause for the carcinoma and for the pre-existinulcerative state. In the second place if carcinoma. is an important complication of chronic ulcera tion in the colon the existing data can scarcely be expected to establish more than a sequential relationship of the carcinoma to the prefatory chronic ulceration Pertinent observations in the literature have been assembled in Table II

In 19.7 Yeomans (67) reported the de eloptment of a rectal carcinoma in a woman with chronic ulcerat e col us and from whose bowel he had prev ously remo ed several beni n adeno-

This case as 1 of 7 that I comans presented

to demonstrate his concept of the precancer ous nature of adenomatous tumors of the colon he stated Both clinically and by histological study of the specimens the transition from simple inflammatory hyperplasia to tumors patholo ically cancerous can be traced through stages of in flammation gland tell hypertrophy and byper plasia and adenoma to definite adenomicinoma It is a loncal inference that continuance of the arritative factors that induce the adenomas stim ulate epithelial hyperplasia unt lit breaks through normal bound and becomes malignant A year later in 1028 Bargen (4) reached the same con clusion and wrote. In view of the various reports in the literature, the frequency with which poly posis has occurred in the series of cases of chronic ulcerative colitis at the Mayo Clin c and the simultaneous occurrence of polyp and carcinoma in the diseased colon the following hypothesis is offered the sequence of events in some cases of malionant disease of the colon is chronic ulcera tive colitis multiple polyposis and malignant disease Since then Bargen and Comfort (9) Burst and Bargen (15) Bar en and Dixon (10) Bargen Jackman and Kerr (11) Streicker (56) Matzner and Schaefer (44) Rankin (51) Jack man Bargen and Helmhol. (37) Sauer and Bargen (55) Cattell (17) and others have subscribed to this thes 5 as it was originally stated by Yeomans and later by Bargen

The observations and conclusions of other authors however have supported an opposing view. In 1934 Ewing (26) stated. It is somewhat remarkable that carcinoma very rarely develops in chronic ulcerative proctitis or colitis In 1030 Swinton and Warren (59) basing their conclusions upon extensive material wrote. It is possible in our series to demonstrate histologically all stages in the sequence of change from normal colonic mucosa to actual adenocarcinoma microscopic study of a large series of intestines from patients with chronic ulcerative colitis both specimens removed surgically at varying len ths of time after onset of the disease and specimens obtained at autopsy we believe that chronic ul cerative colitis is not a factor predisposing to the development of polyps In our patients with ulcerative colitis we have observed another interesting fact. Following healing of the acute ulcer ative process we have known these pleudopoly poid tumors to regress and disappear never observed the re-ression or disappearance of true polyps of the large bowel except in rare instances in which the polyp has broken away from its pedicle. This of course also definitely uggests that the reseudopolypoid tumors result ing from known irritation and infection have dif ferent fundamental growth characteristics than the discrete and multiple polyps which are not the result of known infectious processes never observed the polypoid chan es seen in ulcer attre colitis progress to a malignant stage Moreover Hurst (34) in 1935 Willard with his associates in 1938 (63) and Feder (27) in 1939 have reported on series of cases compri in the spectively 40 66 and 88 patients with chronic ulcerative colitis with no carcinomatou cha ge

With the forego g general summary of the conflicting opinions the data ar anged in Table II

may be analyzed

During the last twenty years and apparently because of the continuing interest of Bargen au merous papers on it is subject have piezed in which the accumulating material from the Vayo Clinic has been utilized. Bargen's n me is as sociated with the majority of these reports. An attempt has been made in Tables II and III to congregate the findings recorded in these 1 papers and in order to extract the data essent all to this study. The successive reports have been computed it is unif rituated that individual reports were not regularly include 1 so that the cases could be accurately identified.

The d ta presented in Table II may be rearranged and summarized in three categories

1 The literature contains the reports of 3 ind vidual cases of chronic ulcerature colins in which carries mad of the colon de etoped as a complication. Of these 33 cases 4 were reported as

clated cases and 29 were reported as individual cases belonging to groups of cases with colitis

2 Observations on the associated incidence of carcinoma of the colon and chronic ulcerative colitis have been recorded in 7 series of cases and in each the percentage of cases with carcinoma has been calculated When these groups are combined it appears that 28 patients among a total of 1 467 cases of chronic ulcerative colitis developed carci noma On the average therefore the incidence is 1 o per cent and the percentage for each of the four series in which it could be calculated separate ly was 13 16 2 r6 and 3 respectively In 3 other series made up of 40 66 and 88 cases respectively no case of carcinoma was observed In 1010 Jackman Bargen and Helmholz (37) studied a group of os children in whom 6 carcinomas developed later in life this was an incidence of 63 per cent among those who suffered from colitis as children A summary of these records is presented in Table III

3 In 1944 Cattell (17) and Sauer and Bargen (55) reported on groups of 11 and 26 cases re spectively in which carcinoma of the colon devel oped as a complication of chronic ulcerative coli tis in their papers which to ether report a total of 37 observations to individual case records were included nor was there a record of the total number of patients with colits among whom

these cases of carcinoma appeared

The matter of carcinomaious transformation of adenomatious polyps in the colon and particularly the relation of chronic ulcerative states to that problem and to an increased incidence of carcinoma are of practical and theoretical interest: From the clinical point of view the natural history of a disca e must be charted before the value of therapeutic measures can be estimated From the standpoint of cancer control it is essential that commance be taken of all precisioning in fluences. Furthermore the pure scientist has an interest in any evidence which may be garnered to demonstratic a relationship between chronic mittaints processes and the mall grant state.

General variance Critical analysis of the accumulating data appears to fortify the hypothesis enunciated by Yeomans and by Bargen that there is an increased incidence of colonic carcinoma in chronic ulcerative colitis Reccoily Cattell (tr) wrote. For a number of years our observation indicated that malignancy was a rare development on the basis of chronic ulcerative colitis. However in the last two years we have observed 8 patients with carcinoma arising in ulcerative colitis and previous to this period 3 additional patients had been seen. At present we believe

## TABLE II —PUBLISHED REPORTS OF CARCINOMA OF THE COLON WHICH DEVELOPED IN PATIENTS HAVING CHRONIC VICERATIVE COLITIS

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TABLE II -PUBLISHED REPORTS OF CARCINOMA OF THE COLON WHICH DEVELOPED IN PATIENTS HAVING CHRONIC ULCERATIVE COLITIS-Co to ued

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that malignancy while somewhat rare is most frequent in patients who have had ulcerative cohius for over five years. We have been follow ing patients carefully for these last fiteen years and in those who have had symptoms for a long t me an increasin incidence of carcinoma has been noted This statement is especially impor tant for a nce it is based upon further e perience (g) O I g p f 27 cases wh h 5 c ses f ca can m d 2 I lymph sa cam (4) w re repo ted I m the repo t th ca es I lymphosa c m cannot be d tifed

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at the Lahey Clinic, it may be thought to alter somewhat the force of the negative expression made by Swinton and Warren at an earlier date (quotation on p 6,6)

as has been pointed out the average incidence of carcinoma as calculated in the reported series of cases of chrome ulcerative cohtis is 1 9 per cent Statistically this figure would require the sam

TABLE II—PUBLISHED REPORTS OF CARCINOMA OF THE COLON WHICH DEVELOPED IN PATIENTS HAVING CHRONIC ULCERATIVE COLUTIS

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TABLE II -PUBLISHED REPORTS OF CARCINOMA OF THE COLON WHICH DEVELOPED IN PATIENTS HAVING CHRONIC ULCERATIVE COLITIS-Contin d

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that malignancy while somewhat rare is most frequent in patients who have had ulcerative colitis for over five years. We have been follow ing patients catefully for these last fifteen years and a those who have had symptoms for a long time an increasing incidence of caremoma has been noted This statement is especially impor tant for nee it is based upon further experience

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at the Lahey Chnic it may be thought to alter somewhat the force of the negative expression made by Swinton and Warren at an earlier date

(quotation on p 6,6) As has been pointed out the average incidence of carcinoma as calculated in the reported series of cases of chronic ulcerative colitis is 1 9 per cent Statistically this figure would require the sam

TABLE III —PUBLISHED REPORTS ON THE OCCURRENCE OF CARCINOMA IN GROUPS OF PATIENTS HAVING CHRONIC LLOFRA

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Willard 1 5	66	66			
M tan & Scha f	3,5	85			
T tal	1				

pling of approximately 100 cases before a newat ve findin could be interpreted as havin symmiciance it is interesting to not (Tables II and III) that the only published series in which no caremoma was found are those numbering less than oo (40 66 and 83) cases. On the other hand in each of the lar er series (18, 2r and 87r respectively) carcinomas were observed. Grantin, the statis total validity of thi assumption calculation of the incidence with the inclusion of the three smaller series of less than 100 cases may have poduced an abnormall lo avera efigure on this bas six seems likely therefore that a forure of shi bith more than per cent may on the avera e express the incidence of as coastion for these two discases

Sex 1 cade ce Of the 1 cases in which the sex of the patient was recorded 8 occurred in males and 3 in females. These are 1 o small numbers to have intrinsic serificance. Wore data on this point are needed they are needed to aid in determining whether or not there may be a devia tion in the incidence of carcinoma in patients with colust from that in persons not o afflicted.

Age incide of In 3 instances we have a record of the patient s age at the time when the carcinom was discovered (Table IV) With these few figures the distribution according to age is shown in Table IV. Here again more recorded observations will be important.

In this connection attention needs to be called to one contribution of the greatest importance Jackman Bargen and Helmholz (22) reported group of o. patients who were less than a steen sears of age at the time of the onset of symptoms of chronic ulcerative colitis. As may be seen from Tables II and III 6 of these children later fatter childhood) developed carcinomas, an incidence of 6 3 per cent Tackman and his associates pointed out that althou h carcinoma of the large bowel was found in a per cent of their entire group of 871 patients when this group of os (in which the symptoms of colitis had appeared during child bood) was studied separately carcinoma appeared nearly twice as frequently (6 3 per cent) Indeed as these authors state. In general the only significant difference in complications between the two groups 1 the relatively high incidence of carcinoma of the colon among children

Arsin it is unfortunate that more data on each member of this rusefule group were not recorded It would be most instructive to know in each each the interval between the onset of the coline symptoms and the discovery of the mahenant change In this group of or children colitis began in each year of life with creater incidence in each of the years from ten to sixteen inclusive Were the 6 who developed carcinoma among the se of the os in whom the colitis began in their early years or were they from among those in whom this condition began in the later period? Were these 6 children those who accounted for all of the cases that became mal mant during the third decade (Table IV)? Can it be that the r c se of lymphatic leucemia and the 2 cases of lymphosar coma (so much more common in early life than is carcinoma) mentioned in the report by Bargen and Di on (10) were among these o, children? If so 2 or poss bly 3 cases would need to be subtracted from the 6

The duration of the colitis in years prior to the devel pment of carcinoma is recorded for g cases and ranged from three fourths of a year in 2 cases to thirty six years in 1 case of great chronicity.

These mental locat on of the carcinoma within the large miscuite is recorded for a patients in o cases the carcinoma was in the rectum in 5 in the terms was not the rectum in 5 in the served of in 2 in the served of in 2 in the served of in 2 in the served of in 2 in the served of in 2 in the served of in 2 in the served of in the descending colon. In another instance the entire colon was involved. In 5 other cases multiple carcinomas were found in 1 of these cases the tumors were confined to the rectum in another there was a carcinoma in the rectum and one in the eccum in the third case carcinomas were found in the

TABLE II —DECADE IN WHICH A CARCINOMA OF THE COLON WAS DISCOVERED IN 31 CASES
OF CHRONIC ULCERATIVE COLITIS

	OF CHRONIC DECERATIVE COLATIS												
Years by Decades		۰.,	0-29	30-3	o- y	50-	60-69	70-7	80-50				
S mbe LP			. 5	6		6	55						

sigmoid and in the splenic flerure and in a cases multiple carcinomas were found but not localized in the description A greater number of observations are needed to test the significance of the segmental distribution as well as of the occurrence of multiple tumors

Thus an analysis of the recorded data seems to demonstrate an increased incidence of carcinoma among sufferers from chronic ulcerative coluts However before the increased incidence can be finally established the problem should be approached from two other points of view. In the first place the general hyp othesis needs to be critically scrutinized and in the second place the hypothesis can be removed from the realm of argument only when supported by a greater number of observations.

#### GENERAL CRITICISM OF THE HYPOTHESIS

In chrome ulcerative colitis there is the follongs sequence of pathological circumstances long continued infiammation extensive damage to the bowel wall and more or less adequate repair (6) It would not be particularly surprising if such preparation did lead to a malignant change for in a variety of other conditions much clinical evidence has been assembled in favor of chrome irritation as a cause of cancer (12). It is not necessary to presuppose a neoplastic factor (15) peculiar to chronic ulcerative colitis and it is not be required that a continuon cause for the two

conditions should be demonstrated. If chronic destructive lesions of the colon lead to an increased incidence of malignancy, a similar relationship might be expected in groups of cases of amebiasis and tuberculous colitis. Reports on such series would add importance to the literature.

A further stul y of the relationship of polyposis carrinoms of the colon is norder and the place { polyps in relation to the carrinomas that decelor incass of chroniculerature colust should be determined Klemperer (38) has said. A striking prediction for rectum and sigm d is not evident for polypia as for carrinoma. More than 75 per cent of the latter are found in these parts of it colon while only 43 per cent of polypiare i and in rectum and sigmoid further more the literature contains such contrasting opini ma a those of varinton and Warren (59) and Bargen (6) and in the future it will be important

to distinguish carefully between pseudo- and adenomatous polyps (45 61)

General mortality statistics of recent date (Special Report U. S. Bu eau of the Census 1940) indicate the high frequency of colonic cancer which accounts for about 12 per cent of all deaths from cancer. For this reason when dealing with data pertinent to the present problem an attitude of continus discrimination must be maintained

Finally in the statistical evaluation of evidence for the elucation of problems in which the mathematical preponderance is not likely to be dramatic the greatest care must be employed in the scrutiny of individual case reports in the in spection of source and in the critical assemblage or organized data. For example in the utilization of reports from large and popular clinics assurance must be available that no factor of selection has entered as the result of a tendency to collect unusual cases selection of this type or on any basis will distort the pieture of the natural history of the disease.

#### THE HYPOTHUSIS REQUIRES THE SUPPORT OF MORE OBSERVATIONS

The practical and theoretical importance of the hypothesis which is here considered cannot be denied. Attention is called to the paucity of available reports. In order to refute or to establish the hypothesis more detailed and more extensive data than has thus far been published are necessary. Irobably a statistical study of possibly 5000 cases of chrome ulcerative colitis will be essential and it eems hilely that data in this amount are now in the records of gastroenterologists and proteologists of this country.

To be of proper value future reports on groups of cases should regularly record certain information and individual reports should include the data required for their admission to a series. It would enhance their value if the following eight items vere to be found in each case. (1) sex of the patient (2) age of the patient when carenoma vas recornized. (3) duration of the colitis in years and/or months prior to the development of cartinoma. (4) number of cases of robits observed among which cartinoma was songist as a compilication. (3) diagnosis of cartinoma made by his tological examination [6) evidence of pre-existing polyp (millammator) pseudopolyp or adenoma

tous polym) (2) segmental location of the carrier ma and (8) special features of the carcinoma (sin, le multiple or diffuse)

#### SITURGERS

1. The literature contains a parcity of reports. on the a sociated incidence of colonic carcinoma in chronic plcerati e colitis. The reports of only o8 ca es have been found in which the diagnosis

of the carcinoma was made histologically (a) Thirty three individual case records have

been published

(b) Sixty five cases have been reported in groupe

2. The literature contains a record of a series of

cases of chronic ulcerative colitis in which the associated incidence of carcinoma was observed (a) Among a total of 7 467 cases of chronic ulcerative colitis 28 patients developed carcino-

ms and the average incidence was I o per cent (b) In isolated reported series the incidence

was o o o 1 1 16 2 16 and 3 2 per cent (c) As n le series of or children with chronic

ulcerate e colitis was studied 6 carcinomas were found later in life an incidence of 6 3 per cent among this group

2 From the practical and theoretical points of view the hypothesis that there is an increased incidence of carcinoma in chronic picerative colitis

is an important concept

(a) Available evidence appears to support the hypothesis

(b) To finally establish the hypothesis a study based upon more extensive material and more complete data 1 necessary

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# ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

EYE

Berke R N Resecti n of th Levator Palpebrae M sele for Prosis with Anat mic Scudies A ch Ophik Chic 945 33 69

The author discusses resection of the I vator pal peb as superiori muscle for the correction of prossilie points out that pites, may be acquired or congenit I un lat rai or bit teral partit for complete and that the caus a categorie into which surgery I rit correction of prossis may be divided

In one cat gory the frontal s muscle is utilized in the second the super or rectus muscle is used and in the third the letr pape brase is resected or ad vanced. The last pocedure is the operation of chose and sem to yield the best res its provided that the at muscle is pot completely paralyz d of ced res be that I the levator muscle of the

f ced res behull the levator muscle of the upper exclude the dude the follouing teking or folding of the aponeurous of the forator in sele (E r b seh) shortening of the levator muscle by e as not a part of the exist muscle by a change of the selection of the tendon of the lat muscle the ogh the sking (Wolff De Laperso e l'Ichnig Lanca te Blas to use Wh. 1)

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BkrEE The Cau 1R! if nabip of Lympi ld Tha bout the Fu tachian Tube and Ear Path logy Loy I c? 945 55 74 The author classes the pct re about th chain rice in four types as f ll was Type 1 in which there is no demonstrable lymph oid tissue about the orifice

Type 2 in which there is a m n mal amount of lymphoid tissu demonstrable

Type 3 in which there is a moderate amount demonstrable

demonstrable

Type 4 in which there is considerable lymphoid tissue about the or fice sometimes lymphoid bands are pecent and the orifice of the tube has be n

narrowed

Fi e cases are reported all of which i ere subj eted to aden id ctomy with the LaForce ad
no dectomy

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Kinney C. E. A Critical Review f the Fenestra tion Operation Report of Cases La g p 1945 S5 7

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Prolos

Prolong d observations on 3 cases of otosclerous sho ed 71 which the hone-on duction response had been increasingly poor for th feq ences from 1024 up and and 1 these the bo c conduct on loss had p ed to be progress; e Of th 8 fenestration case reported a w rea this gr up and these failed to demonstrate a satisfactory hearing gain. The author the fe consider so that a bone conduction curve sh wig a steadily decreas g respinse form 1024 up and size contraindant inforoperation. An aving the threshold loss of less things gleechels for the 224 and 036 fire neurons to an conducted.

av r ge threshold loss of less th n 35 decibels for the 5 24 and 036 freq enties to aut conducted 5 und 13 cons de ed the le el of practical he ring Psychologically bowever it is better t speak of the hearing pe ce tage rather thin the percentage of be ring loss.

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JAVRI D. MD

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#### NECK

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s benental a tho t in I ment f the adi n g submaxillars foss amdl nen ckin i nd ne nd th ough the m l hy id mu cle ill at si et el drain such an accum I tion O cas nall hen th ah c's slocated immed thu I the font fthe to gue it ca b dandby an ntra ral c on If the subma llars fossa e the s bm llars and th parapharing leg nh b n n ad da der po ure fth r is d cat d the Mosher T haved ness naheh po's the subm ill ry gl nd with upw d ret act no t f its fossa allo ad quate spl rat n of the tir r g on Thro gh th x posure the gl ed fi ge r an artery clamp p hed pw rd and b ck a d ll nter the parapha ang spa and n t m r tracti n ll expos th ver l sheath ontai ng the ca t d and internal jugula en This i c ion has g en most sat fact ri

The case h tory of the mly f tality in the goup is per ted the aut py report evenled a larg ab cess ocupying the ght temporal lobe which was

p b bly of s r l m th s ta l ng Bevij n Go w MD

J k on C L and N tris C M Th S rgical Tre timent of Cance of th L ryn L y go-

A cc tanalys of the endrs list ma erest fo post t we then cer fit I symete the third Timpl Users; II push I fall listed by I yan by rg rg and radat d rangth per id for you can to fispe cert for the term of the result of the post of the constant of the result in Sope cert for a so dogs of 50 pc cert 1 fact the form as obtained by the result of the result in Sope cert for a so dogs of the form of the result in Sope cert for the form as obtained by the result in the solution of the result in the result in the solution of the result in the result

Ame pati is with ext n. 1 ns po whom I pp g tomy w s do e d d Du g th m l pp g tomy w s do e d d Du g th m the potra ted fract nal tech q 2 of them had timise and its had can act less no 0f th in t seg our soper t pres ted a fi se c and f the ettracg p sp c t pres ted.

he year cu

Th a the resemphasize that the most significant and blipfuifigue are tho obtained classly dented as distributed as

Col W H SI ghter D I nd Ros it L J P tential D g I nt ic Nod I G it J Am M 1 945 7883

The author de the dag fin jular gt ud fehead g

28 or 7 s per ent had care n m of th thyroid I

33 of these the careinoma occurred in n t x c nod ular g iters (22 in solitary nodular and 11 in multi nodul 1g sters) in 4 it courred in to 1c nodular (all multinodular) g ters and in pat ent the careinoma occurred in a to ic d fluse goiter. The a erage age of the pat ents with ca ci oma was forty to ye is Thirty sev n per cent of the carcinomas were estab lished to have ansen f m fetal adenomas and the auth is estimate that an equil number had a s in lar origin but t s e ergrowth prevented proof of th's \mety per cent if the ca c omas occurred in nome S ce a diagnosis of cancer was mad p operatively in o ly 21 per ce t f the cases ( n 21 per cent of the ca es th canc was fou d'at ope a tion and in 58 per cent it was diagnosed in the lab orat ry after operat o ) the mporta ce frem 1 R no t zicnod la g iters is obvious Radiation p f erably with radon seeds f llow gec n f th carcinoma resulted; five; ar cure in 5 pr at

f the cases Devel pm 1 fixely I 326 cases fb gn to e nodul r goster stud ed the erag dur tion I the nodule bel ret cty i veloped was n e and thirty seven h dredths years. Sympt ms d el ped ins d u ly nd were m re ften found in the lder age g o ps Alth h odin rarely i duces

tox city I nonto ic od I s the authors ren rt pate t who de eloped severe to c ty hile t king with d sappe rance of the toxicity on cessa tin fth iod e

Lo l'effects f od l g : 1bout 2 per cent of th p tients with nod lar goiter e mpl n of pres sur symptoms chiefly ferable to breathing

S) I mic m fe lat s Heart disease is the m st t x c odula gotter is thought not to p d ce oth r that pees esympt ms but the improv m nt in the h lth of ma y pat ts afte rem val of supposedly nt c nod les co vi ces the authors that u rec

gaized to city s ften p esent The uth se clude thin ntone diagi t is she ld b remo ed a you g people b ca of the high incid nee i ca cinom and of t serty in late life Сито И Титет И В

P lm r M V Hype thyr idi m nd Thi raeli 1 I i W 945 335

Thath stddatotal froocses fhype 1 sn , s me of which had hee u 1 r thi racil tre tme tfra l gase ghteen m th MI fth pt tshdah simetabolerate i+3 per grat r ad 8 perc at wer wom a Thel ag ra gedfomf rt ntos v ty two y ars S fara pos bl un ly e anl white bloo! nts w t ke e ry th'rda a dth us I blood ch m cal mdw ll Threwre gop f The first gro p were o med cal m n ge p t nt m nt e lu el 1 th second gr up re re ferred to urg ry f r n ft o reasons a p coll d go ter which h d bee m to c hut wh h fildt dmn hin i und rth uracil treatme t and h dt be rem vedfrom tie so and (2) mability of the patients to return for follow up Operation was planned wh n the basal metabolic rate had reached f om one third to one half the pre treatment | el At operation the gl nds were much more vascular than glands in patients not subjected to thiouracil treatment or 1 patients who had been g en tod e preoperatively \itamins were given three or fou days preope at ly

Med cal ma agement consisted of the admin stra t on of thiou acil o 1 gm every thr hours for three days or gm every four hours for f om three to six d is then o 5 or o 4 gm daily for about three m nths foll w which th mant nanc dose was

from 1 to 03 gm daily

I 2 of the earle ca es crystalluria appeared The adm istr tion of 0 67 gm f s d m bicarbonate with each d se f tho racil vas then i st tuted in all cases and no further developm at of crystall ma was exhibited. A corbic acid given a daily doses of oo mgm with liver extract a dimultivitam n prepa as thought to din counteracting the uracil denress n f the bone mar w Th giving of vita m sddnot seem t alt r the low n g of the meta h he rate

Phen ba bital n appropriate doses as g v n for a pe d of fr m two to four w Ls Daily doses of is gm f therest or from out to or mem of thyro w regi en t il pat ents exh b ting e pb thalmos at the b ginn g of treatme t later they we e given to all pat ts Thyro in pro ed to be of value in p eve ting transent enlargement of the thyro dglandd ring the early part of the t eatment it was also of value in contrilling pitting ed ma Only exe pt onal cases rece diod

The results of t eatme t ere as follo a

A case fall d to respond t thiouraeil h gh r the nitial bs al metabolic rate the more rapid and dramat e was the r spo s In cases with card ac decompe sat more thi uracil as re quired to affect the puls pr s re and to c ntr I the othe that toxic symptoms Of the first 22 cases o d veloped trans at leucope a W this iding the drug for a minimum of s e to t h urs verc me the effect and it dd t recu on the resumption of th oursed All cases improved subjectively the nobjectively

The m st rap d decre se in the basal metabolic rate ccutr d d ring th first m th f tr atment the ag int al basal metabol crat was +70 and at d of nety d ys the rate was +10 Pat ents treat I with thyroid or thyroxin and thiou ac l eemed to co mo rap dly a d with fewer sid re ct ons th np tie ts recei ng thi uracil alone

A pat nt came to perati n except for the m ntio ed \ cas requ ed surgery f r t ictly med cal reasons \ \l croscop c sect ns of the ther d gla ds t eat d with th our cil ariel in d I hyperpl sta and coll ds were pres at in th s tions i z gla ds treated with thiouracl a d

thyrox n Two gl nds which wer treated with th ouracil and od re simila t gla d tre ted with th ouracl ln CLINTO II T IE T M D

Leys D Hyperthyroidism Treated with M thyl

Thlouracil L neet Lo d. 945 48 46 Methyl thiouracil was used in the treatment f 16 pat ents with hyperthyroidism with good results no tox c ympt ms f mportance we e ob rved by the

We a c ignorant of the cau I Gra s disease There are I will any cales I which the ende c por ts to a pur ly local cau e 1 the thy rord gland itself Adenoma exists m re often without th n with hyperthyrodsm Propt ss myasth na a d pos sibly other features occur c incide tally h t r dis sociated from the sympt ms d rectly att ibutabl t a e cess of theree ne Tr tment wh th r by r st alon hy sedat on by pa to I destruction f th the roid through surgery or ad ation ar with a dine of thouracil cau e a d cr ase of th circulat g thy ro ne Th diseas is thereby ured eith r because the rel t ve thyrox ne defic encyproduced stalo ge than the cause of o erprod ctio or because the or g nal ca se is itself a gment d by the b pertby

o d sm and d s ppears when this is co rect d The discovery of the act on of th ou a il ndr lated compo nds on the thyroid g ves us the p w r f reg ulating thyroid act ity with an accuracy quite un urpas ed by oth r fo ms of treatm at u ed for by pe thyroid m a dindeed unsurp s di the whol held of indocrinol gy. Fo the prisent and u tl experie ce has fully d te mined the optimum co d tions of tr atment it is best that this compou ds should he s d nly by the spec al t with full lah atory control The follo up is e ceedingly imp r tant and should b und the sup rvision of the pe

Ctr cial st also B #

McCl r R D nd Lam C R End Re ults in the T atment f Hyperp rathyroidi m A S # 945 2 454

Dis as s f the parathero d gla ds may give a hi tory furnary calcul sk let lab rmal tie path lo cal fr ctures o h ne and to sel pans Roent g nograms fith skull and lo g bones giv e nfirm tory evid ace Laboratory tests clinch the d agnosis There is levats n of the crum calcium and pho-

phatase and lowering if the serum phosyborns, Six cases are reported

Case 1 A woman age forty four complined chefly of pain in the right ch st and right thich. There was an eff sion in the chest and the roenter ogram f the f mur sho ed a de t uct ve process ; volving the lo r third a pathol cal fractu e of the lower thi d of the left f mur de eloped Further studi s were carried out. The pati nt ded Surgery on the par there digitands hid not be en performed Pa athyroid poisoning was co ide ed as a can e of

death Case A woman age fifty-on h wed a nathological f acture of the f mur 1 cyst c parathere d adenoma was removed. The pate thied form nth

Case 3 Am a e fifty-one p sented a p cture of cacher a Roentge og ams of the skull and long bones showed ostroporos s Small ar s of calcifica tion we e present in b th k dn y reas Hyperpa ther dem was fim dby lb ratory studes A

lat r: a hypoparathyr id tate

parathyro d adenoma w s moved on the right side The pate t made a rems k ble une ntil re ery w th completer t r t e c lient he ith C se 4 A young m age n ete n c mpland chi fly of renal c le l An pl rati n of the n ek f ra parather d tumo was carried out A par the

rid din m and a odul fino malthyr diss e we e rem ved Con al scene wa uneve tf ! Ca es Agirl age fou te n e mpla n d [ k ock s Lab ratory studes show d shn rmale ] cium hal ce Roentg n rams we e co firmatory

Su gery ev aled an ad n ma on the left parathyroid gia d Co alese n was alm at u ev ntful The k ock knee d f rmity cleared up witho t

operat o

Case 6 1 you gg ringe e ght e omplaned of alump n the eck and pan n the ight hip A night pa thyroid ade om as removed Recov ty was u ve ti i

The alvigo tint h be file df mfu t eight y ars follow g operat n a dall appert b n emale de du ls

RICHAR J BE'N TT J M D

## SURGERY OF THE NERVOUS SYSTEM

#### PERIPHERAL NERVES

Davi L. Perr t G and Carroll W. Surgical Principl's Underlying the U e of Craft in the Rep ir of Peripheral Nerve Injuri's A n S g 1045 1

The repair fper pheral ne ve injuries has i l'dit reach the state of a compl tely r cognized definit v plan of treatment This has leen due to the lack of gr ement concerning the histological changes also crated with regenerat on and the failu e to follow up larg groups of pat ents from a clinical viewpoint and thus evalu to the various surgical p ocedu es

The ideal m thod in the repair of a severed nerve is accurate end to-end suture thro gb the perin n m at the a liest time possible. This necess tates the use of very f es lk suture without damage t the nerve fascicles. In large wounds specially the they are associated with fractur s the possib I ty of a seve ed nerve should be kept in mind If the loss of nerve substance p ecludes p imary suture the nerv ends should be identified and a met lic suture relip appled to i cltates rgery at a future date

It is very important that a pot nti lly infected w und does n t d ter one from app eximating the rve ends for rege rating nerve fibers are q te re s stant to injectio and the perincurium forms n x cellent harrier to the surrounding suppurat

Ifist I geal evide ce r v als that the nerve fiber g ows down into the dist is gment; the presence of sounding suppuration if owever r gene at n n er occu red when the nery fascicle was nfected Th use of the sufon m les has been a gr at ad vantag in preventing infect us h t it d es not

imply any i t down a performi g m ticulo s de bridement and mechanical clean : g This eg me h : allowed much arl er exploration f th p pose of performing a lat ranastomosis without the fe an infectio s flare up-es n wh n a p intary infec

to h dbeen pres nt

The se of nerve grafts has not rece ed the cred t it d s rves Cable grafts and clemically fix d grafts hav n t proved sat stact ry Howe ut g n u and homog no s grafts of s enti lly th same si e f th divided n re should be u d Of nly the hom genous graft w ll through c s s ty us ally be obta n ble. The autogenou gralts a e mor satisfactory becau e th or gm i n r lemma struct e pers ts and results in a ph c tructur Th hom genous graft becom s a h t omorpho s structu e as it is complet by re placed a il the ne of zation f llo s n co rie Neverth less satisfactory n ens es it 1 uggested that th d tal suture l should be resected and resutur d b ca se numal expe im nittion ha h w that by the true the nr ibrsh ere chdth sat ccatn li rm tion may pret at f rther d wagrowth

Alth ugh the seriousness of conc ssive nerve damage in gunshot wounds has lo g been recog nized the authors describe in detail the actual his tological changes that result The immediate dam age is much mo e e ten ive than seen n sharply severed nerves and ext nds for se eral centimeters both p oximal and distal. This is differentiated from walleman degenerati n in that a severe mol cular de compostion of myelin a d damag to th Schwann cell result while the mes idermal end neural ele m nis survive. A resulting heterom rpho s truc ture is then the r generating p cture

An intere ting fi ding was that ne v contusion m , inte rupt the continuity of the perincurium and r sult nan utgrowth of n ree fibers to ough the de fect. This explains the many variations in return of function o lack f regeneration in contusion in juries t the p phe l nerve

JACK I WOOLF M D

#### BRAIN AND ITS COVERINGS CRANIAL NERVES

Robbins S L Brain Ab cess Associated with Cong nital li art Dis ase A k I t M 945 75 79 Only 26 cases of the rare synd me of brain ab

sc s with c ng nital heart disease have been r port d in the l terature this includes the 3 forming the ba is f th a ticl They were selected from 7 58 autops es perío m d during the years from 1936 to 1943 at the Mallory Institute of Patholo y

of the Boston City Hospital

The z cas s are will documented and presented f m the p thological p int of view although the cl n cal record is ad quate. A ne was d agnosed be fo ed ath All 3 occurr d in fem les ag d ten n ne ad tw nty ye re resp ctively No foc s of in fection as found in any case and it was inferred that the invol em nt of the brai as due t s ptic em hol from ome unknown source. The a cases p e sented the t tralogy of Fallot which consists of (a) de troposition of the a ta (b) pulmonary stenosis c p imonale with thick willed ight vent icle nd (c) def et in the interventricular septum One case had pat rt ductus atteriosus Only 2 f the 26 cases in th 1t rature were corr ctly diagno ed be foed th

Attempts re mad t p duce focal ar as f en ceph lomalac a in rabb is by injecting particulate t th nte 1 carot d artery followed in f om ten t twleday by the injection of v rulent cult res f ga my Th att mpts were unsue cess i and m w k on th s phase is n prog es The hope s e p essed that in these cases I con gen tal heart d case with I cal n urol g cal sign correct dagues s may permit the d 1 pm t of u essful ug cal intriention

> ADRI LE SEUGGRE. M D

Ehni G J nd Adson A W Lipom fth Brai 04 51 00

Linomas of the brain because f their trime rant and the fiet that most fithem d in t cause sympt mage igns during If a celimically unimpo tant t m rs Most of them a e unexpect divencou te ed taut ps Up to the t me th I terat e as fa as the authors o ld se rt in does ot o tan data on ny ra of l nome of the hear which n a subject d to s rescal tt cl

I noma of the brings decored a cares at th M & Clase In one of the er ses the les a was of d ct e f s motoms h ch led to s re c 1

With the 2 cases eported ath rticl 7 cases flooms the hea o of the tradu teranual erves have be n r ported in the I terature. The fa or d s tes f right n the orde of f ou nev the corn callosum the entr l dencephal c

structures the choro dule u o th a nt scula wallf the late al and the dentricles and the dors I

surface of the midbrain

The mechanism of fo mation of the lin mais or bably a perversion of diff c test on f the or m it e meni e Element th fat fo m: Dot n talites are peets them n ges and the I pom de elons whin the ectode in I mese cham so t b ting to th leptomen cs i d f tive

This turn r has slight 1 cal import nce but it must be dided to the list files not my ang differ nt tin hen calcum is die e don rentgen

log cal e amin ti

#### MISCELLANEOUS

D vi J II M rrow W J and T mey J A
R sults in th T atm nc f M ningococcic
Meningiti with Antitorin and Sulf namide
Drugs J F d t S L ss 945 6 455

Results ar epot d na se es of 3 q es cut e ca es f pid mic mening to Th pat nts r nged age f om t o months t 1 hts 1 rs nd c ex ting path logical co dt us of the heart and kidn vs lu gs l'ver or oth org ns we present n r n Te tment cons ted in the administrat n ff m oo ooo to oo ooo un ts of m mg cocc ant t n comb ed the lan lamid o sulf da n n th hif s ald ages Th latt rdru sudn f the cases Thatt nad lut d of thu al ton slut c tamm a c 1 000 d n ln It asg nby mta n u d p o raperiod ffr m ight to sixte nh rs Wh th blood pec ewa low f m 5 t occ corting r g e t ced hadth d 1 co tin ed at th rat face of th ooo sol tı w the eral ter of fi d

The total m t lt r t was 13 gpe c nt 43 p te tsf iling tos rvi Sulf dia in did not s m t alt the mo talt rat s compared w th that i i I wing the us of sulf n lamd When th p te ts Imonbund on adm n tin Idd (7 dving

thin f to wight h urs of admiss n) them make ate SS per cent (26 of 20 ) The elm rate and ther death which we du to s cond ry cau en fter apris ent ecovers from the manufacture d ces the mo tal to ate t 26 n c t

The Wate ho F d i h | me de | oped in a pat ent T | pat | ts h | cl | col ant b cte iol e calla n I t lan but both a c e ed Seventy two p c pt f the ratint h

F F en erimad h suru de rendam d eloned erum ichnes H wy L SRE I MD

out S J Th T atm nt of M ni gococcic
M ni gitti in Children with Si giel trave
ous Dose f Sodium S 1/ di in J Polytis Wint

Louis our 640 Ye cos of money coal menung tis in chil

d teated with as glel g into a enous does f sulf d rease p ted Eght sre dri gr perpo d fbod ght a d pain three ed g per pou d Sodium lactate (hith mola ) (re cep pond fbody w ght) v sst rted by mtr ven us d pa d th c le lat I do of od ums l fad e as added to the lactat s lut n By m ns of this i gle i tr e us admi t t th doug hon en getue a rou d small child r int ndadeou t bloda den mal fluid lex law man to ed ou a fin day prind The ln cal sampt ms s bad dm n dlv than sual nd son I flu d cultur b cam ster!

> H TY A S At D

Ziegi L II and O good C W Ed toa Tr phi Di tu ban fth Low rEt mitles ComplicatingP f at IL botoms A A A Prist Ch 945 55 6

t ents f hars

m ths

Of onto the ghd bilate al t f t l I bot mes vath I teral ppr ch desc bed b m anth mm date p t perati pe d'O è h da acute c llan e fal g but ec ered O e vul 1 postop t ely All had h d r tal and esical in nt nene immed tely fter the pe t n Te fthe 7 rs ors conti et h ccas n l phinet accid nts O e had ho t

tens att ck fd bet s n p du
E ght of the 7 p ti nts f llow d postope at b)
had d ff cult es lat d to the l tremit es had blat I dem of the lgs df et and 4

th t s c mp d by ma ked t dern ss In cases th d m acc mp d by l ge bull e rpean g nb th h l On pate th d dem Im tedt thef t d nan the b lla wer not d on the la unacc mp ed by ed m I most : sta ces the dm a mldadt dedt mt p d ff m th pont n sly in

An at mot t c crelat the curre ce i post ope at ed m th th pl ne fth l b t my cut utindb 1 izd 1

skull in relatio to the plef the coronals at ce fail d to g and efficient is entitled appear that he ewas a sightly better chance of avoiding these equelae as well as persisting incontinence by per firm ng lobotomy in the plan if the coronal suture or anterior to it rather than more porterly.

Have A Suzzan MD

Brandes W W and S tton J B A P esacrat Cyst Apparently Arising from th N u nterle Can I in a N wborn Infant A k P th Che 945 39 265

De elopm ntalanomal es are not infrequent in the sacrococy geal reg bec se fits compilet dem by logical evolution. In this region e rity in membry ncie thin u entrocanal a eminume at nebetween the certain and loft espiral cord and the postan light. In adult life the postanal gut and the neur inter canal are oblit at d.

Agraix jety of lumors ithy non descriptic this have been distribed in this region. The author is case is unique in that the cyle was have throughout with ill did entitled glait ussue of uniform the claims. Ependymaic liky represent in seattled a 3x The structure if the cyle not in positic anterior to the sacrum suggeted the it at agos from the neutrent recama because the man in

l me t was neural t ue

The infant g l three days f g w a limited with a cyst c mass the s z i g apefruit situated posterior t the rectum a d anterior t the sa rum

U matton and d fecation ere not interfer d with although th tumor grev very rapidly in size in the three days following both. There we es no clinical and cations fany connection it the central nervous ous jst me.

The growth as successfully removed at operation
A RIE. V DOGREY M D

Stern K nd Odom G L Morphological Altera tions of th Neu n Due t Turn r In a l n A k Path Chic. 945 39 1

The raction of the neurons to various intoxica tions and a culatery disturbances are well known and the reaction of these cells the adjacent pressure has also been tuded. In this article the reaction of the neuron to invession by global cells is studied. I ostmortem material only was used and various types of global matous tum is were found in this series of 36 tumors. Stains of all kinds we employed to show changes in the nerve cell.

Intactne roots ere found at vary g d pths with in the tumor and there as often no in mediate stag het n complete preservation nd complet de truction of the clis. Most of the changes seen were expla ned on the basis of simple atrophy due to pressule. The changes usually seen in circulatory infectious or int. c diseases we centurely absent in the neur ns f und in ar sp ris of the glomatous t m rs a d a surp s g numb. of the neur ns e no 1 ed intact in the d plus of such tum rs.

ADRI VE ER IT MID

## SURGERY OF THE THORAX

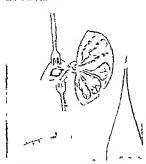
#### CHEST WALL AND BREAST

Wak I v C P G Duct Papillomas I th Breast Bru M J 1945 1 435

Duct p pillomas ar nea ly alw y fo nd in the larg r ducts and ar therel r stuated beneath th n pple o th arcola The majo ity I these tumors a e s gle but in s me cases mult pl pap llary growths re to b f und w th n the ducts The com mon single papilloms oft n ha a stalk and som path logists ha et em dit singl stalk p p lloma It Iways occurs ben thathe napple and frequently causes bl ed no from it

Wakely ble e that ther is too g eat a tend ency tod a t egard duct papillomas of the b st as mal mant or pot at Il mal guant and the cfore requi ing amputati n of the be st This he th ks sh salack of the ght of e pen n e and of ther ugh am atto fe en bre st cmo d It s incorrect t say th t b cause a 3 u g woman has blood sta ned discharge from the n pple the breast hould be mo das the posibility i came s pervenes A blo d stain d d scharge I om the mobile may be cas d by care noma chr me ev te mast tis ) papilloma but it s the espons b lity of th surgeon to make a d flerential diagno is of the e

the condtons



D gramm t dra mg f t yst d i Th t d th h ast is descerted t t ystad t show the la tid us dicts diring the period f is tate Inset. The skin in 1810 united by tures

E ry case must b ex mi ed carefully ad at d finite intera is unt l it is certain th t a d lated d et can be f lt When this is established local es cisi n of the d lated d et with the papill ma can b undertaken The inci i n should rad at from the n pol over the d lated d ct The sk n edges te h ld apart the cystic d latation is opened and the intracystic papilla is completely e ci d Th oper ation is s mpl and n d mage d ne to the d is interrupt d s t res and wh n heal d is sea ! noticeable

Every excised pap floma should be examined mi cro copically for a v evid nee of mal grant d a e The pattent should be e am n d at three m nth stevals during the first ye aft this time a sea ly e amin t on will suffice

STEPREY 1 ZIER Y ND

#### TRACHEA LUNGS AND PLEURA

Tinney W S Moe s h H J and McDo 1d J R
T more f th Trach a 1 h Ot la Ch 945

The perent tudy based man e larenes of neopt mof the treh senatth MyoCle

r i oma may ccu anywhere in the tache In the authors period the locather of the t chea s the r gon m still ly to be in 1 ed in s of th ca es (56 p c at) the less noce red in this egion Thei mo arose nithe pper thi d n8 ca es and in the middle the din rea e In the rem in in ginstacs gret pot n 1th trehen as n ol ed th t th ex ct ite f gnofth prim ty les neo ld not b a u tely d t rm d Ing n e I the t ch I tum rs r m st fr qu ntly tutd n the p t o a ditri all in th lorth difth teba The mobil the dandth ti thatth a a tinde y the rtof cylin mato le the pp thid fith the he a a quam u ll cacin i raden carci d ma to a maus ally as fud ath lo thid

The t mor my ata bil a dallo a to pass na d ut fth l g nd c dg nt ty It ctass tp al andpr t f om pa 1 g ither direct n Whin the les on fu cti ns as ch L I ther may be 1 bess b tn gess fa n which ca mphy em p duc d If the heck

l pr vents ngres but allo atel ctasis results

Only sp t ntsh d ny en ton it kl g of alump nthe thrat Th most feq ntad mp tantsympt m a dypnaca diven chm nt f the timer ad ob truct n f th t ch al lumen Dyp a as a pr mi e t mpt m 24 ases (89 pe c t) a dwa th t ) jt mi

(8) per cent) Dyspn a may be con tant or pare a m l and is f i ly frequently aff cted by change of position

Cough was an important symptom in 15 cases (56 per cent) \$1 ce or gh s cau ed by th mechan cal irint in nof the trachea it is nonproductive at onset but as the les in nlarg a dca es im retracheal obstruction with eco dary inf ction of the ret i ed ce ction the cough lecomes p duct e In 12 ca (44 pc c nt) cough wa a soot ted with he moptivist which v ed f in 81 ght it at lag of the spit in the blood to p oftu e hem relage. In 2 cases the le n vas o necrot that precess of the

tumor ere e pect tel

Chilis and lev r hich are frequent accompani
m nts f b o ch n c care noma ar less lk li to

occu i ca es of t che l t mo

Roentgenograms taken after the in tillation of odd id of mot het ach is he fail h! q ently to h with it nes i the les on a d m v ften le d to the c ect dig m. Sometimes the tumor may be en directlaringoe pv II we now stasse of ca choma of this takes the dig os i dipendent on brinch opportunities.

Th appea cofcarc noma of the trach a a ses con d bl Theles nmay be fit a diffit ating or it may be poly to land p duncul ted Confirma t n I the dag I course depends n the meroscope v mation of tessu remed t the

time of le nehoscops

Ca choma stut 1 a the pper potton f the trache s best handl d by me n of trach all fiss r and destruction of th t more by electric ag I tion a ad ocated by I gather destruct. I thet more all age trachet my tube sift the traches and the site f th turn can be supported at frequent tracks for each of the site of the tracks and the site f th turn can be supported at frequent materials f each of call for the site of

See levet of a pot uon of the let the hill be in docated by varo so be ervers but the crues a much higher ope at k than the hill will be an at later the results it cheal fin ure and destruct in the time by lect to git in addition recaller ction is esthetat in the hill be and the destruction is esthetat in the hill be and the destruction is esthetat in the hill be and the destruction is esthetat in the hill be and the destruction is esthetat in the hill be and the hill be an

C cama taste in the land of the trach a best first be best rought to a 1th start and the start and t

t nd collint be tated do at lb m furg cal dath rms the e of roentg thap le flb div marked b ft.
Ti bestr its lm th th rape test ndpont

ha been bt n d n th cales feylad m i ce th lanilly frad and d befrea orrect d gnos established the prognos f t m f the trachea is poor In most cases death s cau d by t cheal obstruction secondary pulmon ary suppuration or hemorrhage. Although the life xpectancy of most patients is between six months and ne year there are some notable exceptions. The six true per ticularly of tumors of the cylinder magroup.

McDonald J R H rringt n S W and Clagett
O T H m rt ma (Often Called Chondroma)
of the Lung J Thorac S & 945 4 1 8

This article is baled on a study if 23 cases of hamart ma of the lung In 3 of these ca es the tumor as semo ed su g calls. In the mai g 20 cases the t mor was discover dat autops. These 20 c e Bere pat fa consecutive series of 7 072 cases in which autopsy was pe f rm d The in erdence of h m rtoma of the lung in this ries f 7 972 ca es was o 5 per cent This tumor occurs mo e freq e tly than ha been rec gu zed It is trictly ben gn and nly ceasionally causes symp tom In m t c sc the diagnos s has to be made by roentgenographic vam nat n Ahamartoma sb ld be su pected; e ery cale of oltary lesion of th I ng Frequently the stumo cannot be detigui hed from other less us I the lun, ntil the t mo s e amined m cro copically

Alth ugh hama toma of th lung 1 a benign slo g on net m th tusually is a smptomatic we be her that it should be rem d surg calls Th r a nog d tumors and ny gro ing tumor s a menace that h id not be t l ted pro id d of course that t can be rem ed with r as n ble r sk lur th rm e one is limited d ag o tically by the ro nt gen g apbie appearance I the lesion Th re are serious 1 s ns of th lu g wh ch cannot ther m be dist guished a th certainty befor operation In the case of the sm ll pe pherally sit ated t mors l cal e ca n ith m m l acr fice of p Imonary tss e can b carr d tsat sfactor ly Lobect my e n pneum n ct m m be eccessary fo larg r ce trally stuated t mors



Fig 1 H m rtom [nght] g (case 3) th t mor has

The operation sh uld be perf rmed th intr trach lpos to p es u e nesthesia The app ch ma bego m dbs the tuate nof th tumor h t we p efer a posterolater l incis on curving r u d the top of the capula Percet n faling gm nt I the fifth sixth o e nth ribw llaff dad quat expos r in most instance. Addit on l e posur can be obt ed by resection fish rt egments of the adj c nt ribs posterio ly I necessary On pal pat on this turn h rd round or lob lat d nd s frou d dbs n rmallung The turn r u u lls ubpleural but there n pl ral r s kement The extent of pulmonary res ct on is d t m n d h th stuating dth ze of th t mor Fr en ectins f the gr wth hould b xam n d m c n cally mmed at ly s th tits n t r can h det mi ed w the t quest n Th 1 impot nt h ca ha ealr dipo td titi mpo bl t m l a p sit proper t e di gnos and il the les n should not pre to be a hama toma moe tn pulmon ry resecti n m tht be n ces are

#### Chambe I in J M and G rdon J B nch ai Ad n ma Treat d by Pulm n ry Resecti n J Thoroc S & 945 4 44

The apd pr gr n the races surgers he per mit dithuse fip lmon ny resecut annith teat ment of bonch lad noma. Althugh the turn recre first teated be end honchail r moval pi monary e cron as prefer ble for the fillo and reasons (r) toflers ad finite ecue (2) the har dissociated with the damaged in gidstal to the tumor a e a odd a d (3) some of three tumors a e thought to be potentially making at and occasion

ally they metastasis Endohr nehal r mo al has f ur indicate in s () the e cases which are not easonable s g cal n is () the who him of e the traches (3) thos with an alsected (4) the traches (4) thos with an alsected of the traches (4) the traches (4) the traches (4) the traches n which the tumor is entirely with n th bronch s e sil) cee sibl a d att ched by a lor g slender ped cle

The uthors port cases 1b n haladen mass patients we esubject d to lobectom; was s be ted to p e m nectom; a dit e plorat; thorac t m; pt nts died follo mg l'n bosops. The respons t p lm any resection was ry fa orabli and the were n d ath. In 5 ac e h mmh ode n l ement was enc unt ed

The ithors has performed lobectomy where or clocation of the trr permitted because () also means let as on it is the like haracte to of these tumors and if a pneumonic cft with solon in ludes only 20 g cm m fithe bonchus () the palpablo ris bil media than la desmant libecse ted (these as the most if quent watesstate chann l (s) it me bodity and metallat tes a live (q) less fith lng acrub d nd (5) a ubseq ent thorrocoplasty in whe a determined to the control of the long that the control of the long that the control of the long that the long that the long that long the long that

Pulm nary ese to n completely r m es the tumor and the dam g diung distalt the l truct

Endobr nch I therapy lacks th ad antages men to ned and h s me di d antages It requires repe ted man pulat us sine I cal r currences are lequent and the sk is r hmrhgeral I ng peat d b onch cot c t tments the f r don Such sea ing a ! st ost it ef res with the el nigmeh nim ! th b chu (clars act n br nch lpe tl) and pr I po es t pulm nary suppuration Th p ne pal therape tie objeti e of mainta ning a patent are is df tel f scat ical st or sub tit t d fo a bst ct g tum r Eve in th ab enc f scar g an il cal r curr no st nos may ocu It is fintrst that the u of d th in these cas i de usually t pl al and pul m nars s pp atto f ll ng the b ch l bstructe n nd c nally t f tal hemoptyses f l be hepema ip late y the in r co d f d ath due to m tasta es J SEPER VAR VID

S ybold W D s d Cl g tt O T Ca dl vascular Distu b n s followi g Pneum ect my S gery 945 7 538

The cords fas patent n bompne mnc to the fone had n npe f med we tuded to d m the fone co a d m g it de fas gn feant fill f the blood p u on the irr tur for the operating room to the hospit loom Of these S 76 pc nt) had s gn fie nt d op (a e ge 35 mm of m r curr) n blood p essu

The dri fit abnorm leductio of blot d pess vard widels tith fit mutes at the mum a dfort eight bo si the maxim m. Th are age tim rqi dfor tun fithe pre-et appo imat li no mal that preoprati le is was n e and tenth hus Det maton of the intaple r l pes r we

mad ng patent mm dately aft, de ure of the xII na supp m ct mm. Thes dt man t ns er m d with the pat nin the cp of toas. Smult nous r od of the hold pr s adpul rate we skept. Re reds of umb r it h p it t we ree e die data pet unent to this tudy. In case an wah h the med sinnorm as mobol to the control of the control of the control of the control of the control of the control of the control change in the blod of pes ue r puller te cold be orreft feet with these changes.

As fact is nother post pe at leing lith bild pess homo high nota a dicado cular rife es med ted the ghother vigus we bettly onsided

### HEART AND PERICARDIUM

Bialock A nd T ssig H B S rgical Treatm t of Viali emati n f th H rt J Am M A 945 3 89

Lpt the time the hear is testactory t atment frp lime nary at ones and atresa A

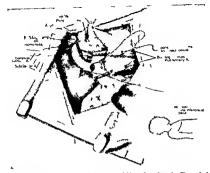


Fig t Ge ralexpos f the perture fild the right and The end f the innominant of ry is be granastomosed to the side of the right polar many ritery. The post in which is turned to the row has the lines tell.

bleb by with a malf med heart as considered beyond the reach is geal and Horr thin the partithree minth the authors peated nightly dremwith sivered gee of pulm ary te on and each of the partitudes at blocked the There suits has been sificient encouraging to vai ant niby report.

These ope at ns er undertaken with the con ic tin this ten though the structure of the herit as grossly binormal it might by on the to alter the curs of the excultions as to lessen examinately the result in to but the expossible to a support the tamil but is only a suble man festat in the

I ling a o m nd compent rypolye themia
Cas is appears when there: I teat is gime of re
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Of the pic palf ctors poducing exanosis in
m if m d hert. the drect hunt g of cnoss
blood nt the stem ce culation L digaard and
vin Slykel stf r mport ntf ctors in the cause f

The red ct n f the h moglobin

2 Th ol m in n blood hunt d to the system cc culat n

3 The rat of tlzat n of oxygen by th pers pheralt ues
4 Th extent fa at n f the blood in th pe

ph ralt ssues
These in est gat rs sho d that n ca es ith a
| f und polyeyth m second changes occurr d
| n th lungs which w e of uch n ture th t ll th

blood pass ag through the largs was no larger in effective content with the signing the alveoir. These perific pulmonary fetors may over the lower stalls important fetor—the volume of blood which reaches the ligs for a rati-

The civil tion of blood through the lungs after b this essential tile. All infants with pulmonary tresa with or inthout a right ventricle and without though the position of the aorta in whom the closure if the duct is closes off the circulation tithe lungs deat an ally age.

Two diff r nt types of co g n tal malfo mat ns llu trate th mportance f they I me f pulm nary circulation n producing cyanosis If there is a single

entricle a d rud mentary tlet ch inber u ally great ves elvs g nofil in the comm in ventricle and a rudimentary vessel f in all size f on the out let chambe. If the great vessel is the aorta and the les in the pulm mary artery the lings of me f blood goes to the system of circulation and the example.

s is tense. If the ve els are eversed the large lame f blood goes to the lungs for ae atto and there is min mal or abs nt cyanosis. If the pul monary rtery list are from the heat or connect with the aorta the circulation of the blood to the 1 gs occurs through the bronchial rte ies only nd cyos's int. If there a canomalies is our turns thall the pulm nary as adrain gint the right sured thea ter aland's n us blood mix and a

large of me f blood re thes the lungs fo oxygena t n. Unless there is card c enlargem nt n th

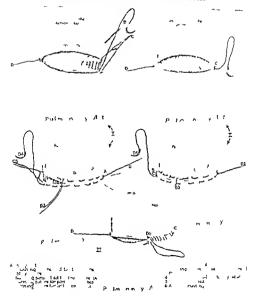


Fig. D tails f them thou by which the def yet muse it ry is not mosed to the fifth pulm nary times

1 b ad m

rght d n c no is util temnal circulton lipse.

The fir mayer m lirm to fthe hard cats dob manth with fir he did ther do culat to this so dissert hack ip him nare circular in the cased the many and mis with cogenital to the sea.

The fearbilt familiary in mong time to

to the plm narva t eshas p

tatd a mal sn the pest pe t was
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d fithe est that bid could five no bett
mest mest consideration.

as the ideal vessel to anastomose to the ide of the pulmonary artery but later cases showed the mn minate a tery preferable in patients with a seve de gr e of ano mia

Except for slight vari tions in the 3 cases the m

for procedures w rea f llows

Light ge eral anesthesia with ether or cyclopro pane was used The patie t was placed on his back with the e po eds desl ghtly el vated (the operation was perio med on e ther s de acc rding to the posi t on of the g eat vessels a d the artery to be used 1 nastomosis) The incis n was made in the thi d in terspace and extended from the ste num to the axil

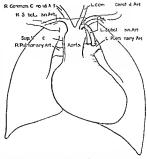
lary I ne The ple all cavity was entered and the third and fourth co tal cartilages were cut to allow the ribs to be sped and geane posure as mF re : The right olift plmonary artery wae pos d and i eed from the adj c nt tis e as far as

posibl O the right s d thi was more d ffi cult and nece sit t dlg tion f the a ygos vein retract on of the supe rven ca a medi lly The y teme vessel (subcl vian r innominat

was then fre i and ts or gin t th aort oc cluded with a b Ildog arteri I clamp When the in nom nate artery was used its branches the sub clavian and the common carotid te ligated at g as and the una m nate artery was cut ju t m I t the ligatures In us ng the bela an the thar c rv cal v rtebr 1 d internal mamm ry branches had t be d vided to p die gth of vessel Th r ght or left pulm de sufficient y artery was then occluded itb buildog clamp just distal to the di 1 ion point of the man p Imonary artery A second clamp wa placed 1 st p mal to the por t where the e elga e off b nch to the pper lobe of the lung A transverse ope ing in the ss I wa made between the clamps the same diameter as th systemic ve el to be anastomos d to it. The p ! monary riery was not occluded dunt I all preparations for the a t mosis had b n made I r th anasto mosis fi e silk on a curv dn dl was s d A stay s pl ced at one nd and a ru n ng s t r ins ted which was nitd an tit til the grat r part f th posterior ro v was a place The stay s t rew sthent ed ndth running utu ein tu n was ted t the stay The post rro was completed ndı tu tıdı oth stay uture The te 10 w was a co tinuous th gh nd through utu e mating int m to 1 tm Figue 2 ho t mos Ih bulldog cl mp were rem ed any bl d gwas st ip dbv th tures. Th lung as r e p nd d e of dditi d the che t w ll los l ith bradd ilk to app m te the ib Th chest ll t ssu s d with m lt pl

The cases t p ented in d tail and n th c as a c ed gree of pulmonary st nos s w th nad q t circulati t th lungs Alth ugh ach dff ed in d tal in ea h instance the op rat n gr tly er d th olum f ble ing th i ngs In th i rst ca e (Fig 3) the dth olum fbloo! d fth I ft subci v n rterv as na t mos dt th s d f

l 3 rs f 1 te rupted ilk utu es



Fg 3 Th d f th 1 ft belavi t ry was tomosed t th sid fth lftp lm mary try

the l ft pulmon ry arte y The pat ent v as a small we k b by wb ch bad been steadily I sing gr und After oper tion the cln cal mprovement as rem rk The baby's appetite imp o ed sh gained neight and is now start ng to le n to alk

The sec d not nt had a right sorts and it was pos ible to anastomose the in m stearte y to the ift pulmonary artery (Fig 4) The patient wa d ply cyanot cand severely incapacitat d-she was ble to fk 30 ft with ut pa t g Two and one h if weeks fter the operation he walked 60 feet r ted a whd and valk doofe t back with ut pa t ng Bel r th operat n the jgens turation of th art malbl d was 36 3 per cent and three v eks ft the p tion it had ri en to 82 8 per c nt The ed blood co at dropp d from 75 to 6 m lion th

bemoglob a f om 24 to 17 gm a d the hematoc it from 71 to 55 The ame operation was pe fo med in the third case but here the a t ca ch was in the no mal posi ton The ope at n wa done on the right side-anast mo s i the end i the nonminat a tery t

th sid of the ght pulmonary a tery (Fig 5) The mprovem nt we demand The child had been d eply evan te before the op rat n but no bis color was good e en w th toxygen aft r the op r tion Ther w sa marked imp ement in his d's po ition and by the th d postope ative week he w w lki g 40 feet ith t p nting or becoming cy notc. The o vg n atur ton rose from 35 5 to 79 7 in d sand by tety fo days t as 83 8 per c nt The r d blood count fell from ro to 6 m ll on

with c spo d ng i ll in the bematocrit and hemoglbn

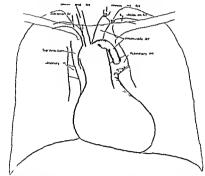


Fig 4 Pocedure sed Th pate thd ght is ch dith om t try w dect dit the lift. The difth since t try sanat mosed to the difth lift by many try.

The a the sweet of art I that an intensity of the childwood idea to long open to possed reference in oiling prings of the first results and the I matter as the limited applicable to the limited applicable that the limited applicable that the limited applicable that the limited applicable that the limited applicable that the limited applicable that the limited applicable that the limited and often the judicial discussion of the limited applicable that the limited applicable

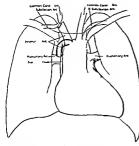
Nother q est a naiwe ed by these geases s woll did not self englomases day of a xem tol the clean felthing in nany rivel rithe per dofth nat ms? These per do of ocluse n we ppr mt. Intrit to nd mit numbers and r m kably eoghthee an is dd nt pper to be get if no ce db the olision. This this wide either that the der a schlosed fiw the distribution of the control of

D is not the bela is artery or 1th inn m nat trilled to his y sy no simpairment forced to not the parts dep doft him my tral pathwa. This pil was bit not the private coole turm diat by after the operation. The a thorsuggested that direal impath tim might be of

v I if d eat th tim f the peration Thispoc du e wo ld be s mpl w th th e posur nd n tadd to the givity of the pt epoed re The type of anastomosis to bpe formed dipe di on the g of the p tent th an tomy pres tad the deg of n m The a th rs uggest than
sst mosis f the subcl an or innom ate rte y to the sid of the right or lift pulm n rs arters Th p in pl is ound and allows systemic blood to f t thelugs The continuo sm m h d bth ides of the chest deat s that the an st mos d ects blood t h th lu go Th ubcl san tery the a test to ana tom s but its ize in 1 fa ts m I mit th fi I blo d t the lungs t su h a degr that the e erd gees fa o mam yn th o ! The for the eleton of the vslt b sed d pend th t nt of the p tie t n df anincreae c cul ton to th I gs Ob o ly th es el chosen and the 12 of th a st mosi sho ld be n I ge th n cessary I th rel I I ano mia becaus of the d ng r ciated with cess h t g fhlood to th I ngs

The a throad scus the method f tung a steme rtry t the plan may c culat n. These a

A ast mos I thed id dp ximal d fo f the es is which ar I m the rteath (nn m nate lite mmon carotid left subclum) t th dwidd dist l d of ne I the pulmonary t es



d thunn n t tomosed to the sid I the right p lim ry it ry

2 Anastom ss ithed vd dp mal nd ithe s hela ano th e mm n carotidart ry t the dyddpo imal end f the pulm na 3 a tery t an pperlob fo eofth lugs

a Anastomos s f the side of the orta to the s de f the left p Imonary artery

4 An tomos s fthes d fthe so tat the main pulmonary a tery

On f th po ible complicati ns f these p ra t n. stheda ger of th mbos sat th ana.t m to s te The imp ement of th 3 p ti nts describ d indicat d that t lid n t occur \s these p tients us uslly ha e a pol cythem; and an increased a cos to of the blood the auth is u ed d cum rol in small daly dose c troll d by d ly pr thrombin dete m nations to r gul t the cl tring t me to do hle the n ml The m icat nw scont udf a thee cek per d'after the ope tin nd its al e in

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these caes my be q t ed The types fab orm It es wh hish uld be ben ft d by th per ton are the tet alogs f Fallot julmenty to with r with t dist po tio ta nd w th w thout d f ct m t fth rght tr cl truncu a te su w th Inhlat es and a gle e tricle with rud m try tltch mbers hich the p Im t to is sm ff The pertinal nd cated only lineal na central logical adence hnthr i der d pulm ary blood fi w The pera tio i n ti de t din ca es of e milet transposi t n ftheg at es el ruth so-call d tt l gv ffall t fth I enmeng tipe and p bahly t a t at 3 ltm the emph z dth tth p er t sh ldn the perf rm dwhen t des the 1 gs t julm ary cou opl tin t the hl R

TR REAL RY

ESOPHAGUS AND MEDIASTINUM

Harper R A L and Tl c nco E Benign Tumor of the Esophagus and Its Differential Diagnosis Brit J Rad al 1045 18 99

Benien tumors of the alimentary tract as a group are n t inf equent but are relatively rare as com

pared with malignant conditions The clinical sympt ms can be briefly summ ized n the approximate descend ng order of frequ ncy ( ) inte mittent retrosternal sensation of dull pain or of pressure or of an aching sensation which was usually referred to the lower or middl part of the sternum be ng som t mes aggravated by lying on the back (2) epigastric pain after meals or without any relat on to food (3) anore 12 (4) dysphagia often the intermittent type (5) occasional vomiting or a comous vomiting d e to dilatation of the esophagus

The author reports a case in which the diagnos s of a benign int insic extramucosal tumor of the esopha gus as made roentge ologically. The male patient age forty-one was operated on and the tumor was f und on the poste olateral side of the esophagus The mucosa w s found to he intact The only ped icle was of a vascular fibrous tissue The microscopic appearance was that of a le myoma

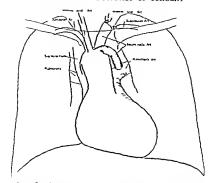
s m lar to ach lasta and (6) loss of weight

The auth r concl des from his observation that th roentgenol g cal diagnosis of an int insic extra mucosal tumor of the esophagus is a diagnosi by e clusion

It is hyjour that a distinction has to be made pri mar ly betweene trins candintrinsic conditions and sec ndly between the mucosal and extram co al origin of the intr nsic process

In the uper r med astinum direct pressure n the ex phagus can be xerted hy an aneury sm of the pos te for part of the aortic a ch aneury sm of the left ubelavian art ry or enlarged paratracheal or retroecophageal glands but rarely by a retrosternal g te neut fibroma es phageal p l ion d's rtieu I m ubst al pa that d tum or cold abscess f the uppe tho cae si ne Indirect press te may be transmitted by the t ch a pushed poster I ter lly by a eury sm of th inn minate artery

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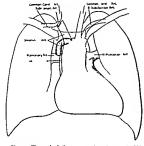
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### ESOPHAGUS AND MEDIASTINUM

Harpe R A K. and Tiscenco E Benign Tumor of the Esoph gus and Its Differential Diagnosis B 1 J Rad 1 945 8 99

Benign tumors of the al mentary tract as a group ar not inf equent but are relatively rare as com

pared with malignant conditions

The clinical sympt ms can be h efly summarized in the approxim t descending order of f equency ( ) intermittent r trosternal sensation of dull pain or of pressure or of an aching sensation which was usually refe red to the lower or middle part of the sternum being sometimes aggravated by lying on the back (2) epigastric pa n after meals or without any r lation to food (3) anore 12 (4) dysphagia often the intermittent type (5) occasional vomiting or a copious vomiting due to dilatation of the esophagus similar to achalasia and (6) loss of weight

The author reports a case in which the diagnosis of a b nigh intrinsic ext amucosal tumor of the esopha gu was made r entgenologically The male patient age forty-one was ope ated on and the tumor was found on the posterolateral side of the esophagus The mucosa was found to be intact. The only ped icle was of a vascular fibrous tissue. The microscop c

appea ance was that f a leiomyoma

The author concludes from his observation that the r intgenological diagnosis of an int inside tra mucos I tumor of the esophagus is a diagnosis hy xclusion

It is had a that a distinction has to be made or: m rily between extransic and intransic conditions and s c ndly bet n the mucosal and extramucosal

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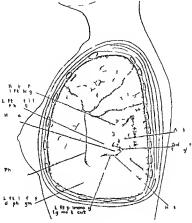
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S MT. KARN VID

## SURGERY OF THE ABDOMEN

### GASTROINTESTINAL TRACT

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The auth rs p esent the finds gs in a s t es of fract onal gast ic analyses co duct d f the past niteen y ars as a pa t i the fundame t I c urse in physig calch mistry at the Ohi Stite Uniers ty pays ig saica march at the unit of tect 18 to Coll geof Rued e fifty m n l healthy st dent serv d as uhjets. The gastic cent nts weee c lect daccord gt stand rdpood es fite feeding of ther the E. Idor the ale holtest meal Gast c data including the milimal t lacid ty the milimal collections. malfee had ochlor c cid the tim f ccu e ce of each a dithe hap ithe curve of thit i cidiy with thus blaim d Comp isons eed n b n th so-call d normal valu s l ste i in m d te th oksa dth lu sobtan df om th st dy f the grup of 50 h althy suh; ts It as f nd th t the valut as a norm I gastric acid to a e far gr ater than th s list d in sta dard t t books

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A ron A II Inflamatory Le ion of the Uppe Gastrointestinal Tract J Am M Ass 1945 127 1 27

This was a pap pesented b foe a joint med cal nd s gical meeting in which the author d scussed certain advances in the diagn sis and treatme t of

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dthed ation fhasympt m G stric nalv is p teul ly as reg ds iree d ty nd the of th ulce t n w s le valu bl D t nce n g th typ dradation of pain and the t of lel

theo rvat eth py ee f nov l at on timmed t cm f t mach Ul at on px mal to th pyl rus i p to be malign t gadl s of the s f the le n Ti as true n 65 p cent of the thr c N arl llulcers f th g ater c v tu and the f ndu of the st m ch ar canc Ul rs nsolving the nt r post r wall p edt b anc r m o pe cent of th cas L i f th l sser cu ature nd thos of the pylorust elf had malgon yan opent Inasmuch oehlf fillulce tons of the t m ch or gin te on the 1 r at th fud that mot of the d gn tic

ce I therega d to the le ons f the regt n Pt nts ath lceratiel i f th stom ch it middl liel 1 gh 1 5mptoms fle th fiet mes more l'aly to ha ca ce st d fulc If on the othe h nd pat nt in th ag goup had had ymptom f fi or mo e ) are the ve was t Eve ol n bould s cnde apptet happals fod b tany dg t omplat that beg s aft ti g f fo t Th d g os f malgo ncy m thruled thy all fth ad t rdp l If a 1 at le t td d lth pv holdt sttuted f th st mach is dem asstbla gm t canh mad lt nth typ finpatcully the tpalliatemars

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in lameter On the other hand no mous ben g I sins ging the clinical mpeso of uf oralle can r have been e countered W can nly ur mise that the lesion sb nig fit ssm ll n e f t is in o of the safe ones if it occ is in y ung d dule o fit i fond naptint th ymp

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I e hydrochloric acid w s found with qual abu dan e in the ulcer cancer group s in th goup with definitely p d b ngn ulc r Of a p allel gro p of pat nts proved to have c nc r of the t mach bop reent sho edn it e hyd ochlo c acid on gastric an lys s Theref re th prese ce f free ac di of litti help n the life ent al di gnosis The abs nece if ee acid ho e er is definit ly in fav 7 of cancer Too much lan has be nrl ce ion the amount

of pan associtd with g t culce tons The comm n bel f th t pain 1 deate b nign ule s
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e es that proved to be cane r prod d pain th t as he d by f od ralkalies nexactly the same manne sathebagag p E ca fanulceration ha praently h l lafter o e m nth of ide l ho ptalt eatment thre h ldl ac flr xam n ton ft r four o si weeks Any evidence of lack of c mplete healt gor turn fulce ton h uld be nside d suffic nt t w t a ly surge v

In the uth rs g up of que tion bl ls ns it w f und th t vh n re ect n had be n do e on the dagn as of bengn ul ronly t h th pathol g t find that the le in was calce the fiv year sed to 40 pe at It quite vident th t th urge n h ld incl de the n dal a as he es tons fo ll dubtful le son The dd Ittle to the ha ard of the p at n and g s th pat nth be tchanc for cure Iti Iso cle th t w should me f qu ntly make a ir resection Oft n as mple tot I gastr ct my th ch I n is ts I to bett r I m nation of the nod i e th n m ny subtot i t ns can be don fely The stru particul ly what h lymph n d in th r g n f th lft g st c ve el app r t b v l ed Th gr at omentum can be s fely elimi ted and n e as quie ha esuited for its abs nee

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th hie sthate lyrdcal urg y ndctd vh n p t nt ppe rs f t catment ith ke f th tomach in th p pylor fundal g as If he rov r fo ty years f g and h lad sympt ms fle tha one yea if his leer i ov r 2 cm d met r th m d ic shuld be g ven If the p tent is ) g and ha a sm ll les or supe mpo d n ymptom f m f the ulc th n fiv v d at on a m e cons rvati e ti

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histo v fa per t cul of nineteen ve rs d rat hieh h d man fe t d t lf by pa nd bleed g It is imposble to as it nf m the h trowh n thet ansition fr m th bengne dt ntoth malg nanes h d tak n pla Th o-lb ght l ant dat gh adm on by the fourm nths w th first clinical lue that ign fice t ch nge h d tak n place It imp ohabl h e er th t thi wo ld ha e been s ffe at t me fo de I pment f the mt tales The h mat l g cal f d g on this admison ecomy t blewth cut bied supe n the natu of th nde ly ng les on Th bs e ff ead dth pese e fbl dinth gst c cont nts as well as th persust t cuit blood in th toof alfauege t d mal go cy It on noa t that neither east oscopic n f cente n er ph c am nation rev led the les ne en though its p esenc t this time was confi m db the fi d ng of m ta ta es It Iso n tewo the that n bland det nd t placement therapy (iron) th blood findings became nom I with a a el tiv ly h t perid f time Tho gh details in the int rval re na al bl n d caf cha ge had ppa ently tak place d rm the tw nd one h if ye per d bet the pate to first h pit l'admission and th ppe

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And rs n A C Slut ky B nd M t R W

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m a ately p eceding the test

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In f a p He f m the colon Most f thes patents are 1 ry poor dt n Thr s

ma ked m Inutr tion with e t me alter t on in the p ote n and blood chemistry i h h mak s niver tens ve operative procedu e un afe nd un se

E perience has demon trat d that in orde to prev nt cu enc ol ler tin any empleat d ulcer case a rad cal subtot l res ction of th stom ach should be emplaced in dduin the fistul start should be east d Ho e r an etems ve block dis et n of the fistul of the transition of the start and the result talgast tomy und taken none stage

nt by too's zardous and would certa; by result in high percentage i faital it. The proc due us d at the Lahey Clime Boston consists of an operate epi in which the first tage is d sig d to pe in tegur g tation i the small netstine and c loane c ntent note it mach and jej num. This has be nu d nee April 1948 at the Lahey Cline This is cern glad high didning the tern and lietum and ref rim g and locolostomy between the true 11 m and hid seemding clon Fill him gith it be cot into 11 th smill tistum and right lone emptyed into the discending colon fill not they care the cottent the stomach and jej num. Sub q of to this first stage proced or the J test have tended to gain in

ght and i m st nst ce ha e a c mpl t ce sat on of th da rhea Tl patients a now sent home frivo o th months aft rwh ch the c nd tag poc dur m y b done when th state of put in mdg n rai cond t n ar imp o ed

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J sky MD

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SM I FOOLS MD

Grav I Tr ma ln Relati n to P ptic Ulcer 1 1 & St 1 J W 945 4 887

The ather the that grim tal ould deat nım l r po t d l 3 us a th that d ct trauma er th r go f th stom ch ca b follo d by th pres nce facute peptic 1 r Caehstorie epeet dn hchaute pentic le rs p forat dg treule rs and perforated d o d nal ulce r lue t taum Other cas re plese tid in high prie ting peptic ulcers aggra t l by inju v sr ve l d by r ut ne actr i

t or agg a at 1 by cc pat onal f cto Frm the ceset d the uth record ds tb t cute p pte ulcer m ; f llo d ct i j r; to th uppe b m n The e is lene to ind cate that complete he l gof an acute lee can and does occu Dath may follow what h tea o bru g f th m c s membrane; ocat lw thero on of the t I ess ls Injury to the g t cm us m m b e s bm cos l h morrhag m v ccu th con que td gesti n f the j r d part Thee tent of th pathol g cal p oces the g st ic all s th

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t m m tb imm d te and (4) th sympt m gns th till m tpontt g tre le twith tav 1 1 vmi

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t I M St n 1 1th Small Int tin f m the Cleat i tt n f 1 I t d tnfl mm t ry Le i B i J S t 945 3 37

cases f bstruct n f the sm ll ntest d t st ct r r potcd As the c t nt f th ll test flid nsd rabl nsdrablrwg pdddt cc rs bef vmptoms dbtbl heth ontaroltl fimm ty fth small teste ldpl symptms apatf m thos of tenosis In most cas ct

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t s e mal gnant chang One tic elef f tict e f the mall inte tine btain 1by shirt irou ting thist ctu by man t m a d when stricture repr flte 1 s nts a scar of a healed past nf ct n such t eatment Heu the pat tw th the minimum ri k When there; po blity that the trict 5 fm lig ant gno is a s cated th acti e inflammat y de reect on a danastom a e i dicated

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Koch W nd F cle W A Duodenal Ul r with Perforation fill wing a Cutan u Burn

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f epo ted cases

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e bund ed d 33 ha e b n eported

The case of Coling ulcons still awat go d anc d elm ted only by the n mbe fob erv rs Those rece v g the most support a e

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The c theory ume the tato no car d t the ntestines b the bl d

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4 The mb he the ry that the Irtedarab cms nertiadfll a ay i sidt ha hen supp t dby Billroth Othrs h ever have called attents nt the fact that emb I n v r ccu n the d odenum with ut cour galo in the stomach a dpit ut alo th t the obt ucted vess I ha

neve b on f und 5 Th begunt d velopment f du denalul ers f ll n inf etio f the bu ned rea ha be n noted b n ny

6 N chel nd Olon neld for the pr m t I k that comp unds of the natu e of ac tyl cloh may be libe to by the bono that the a tylch i espitting tras may his histed by the b r

Dudni lers fil ng buns a gene lis ngl but my be mult ple Thur focton r s The less ryms eit mith tol apahedt a ou reer Th amou t ftis e lost may h great an threa nother tas pidly af ugh g perf rat e p oce The shap of the ul er is rr g ul rand de tate o l g nd na r occas ally la The dges a sh rply a d cl nly cut the be isel nandgraih a dther mynth much nsi mmat nat the magn it s frequently fu n l shaped b ca e of a l ss f more mu memb ane than of muscl t e The utcome is perf ati

hemor h g o spontan u healing Th authors ep ta ae fC f g ulc r n t ty eight y a ld man hich of prick inte st becaus of th fact th t th b rn s t f g texte t because the no p monit ry ympt ms of the d lop ng leet a d b the dagn to diffi lte nounte ed du to pr VI us cardiac and g ll bladd dis as The first gns in th f m f a sea deme s ppea do th twenty this d day after the bur Th clinical p to e appeared t b that of cute chol cy tt a c opary attack a perf rated v cus Th pat ent

e pired thr e d 381 te

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nehd t lly ther a a thra a 1 sup heal g with an inflammat y magn bout 5 mm TOE IK NAR T MD n d met

R ni ff W. F. J. An Analy s f th R. It. f th. Su g cal. Tr. tm. nt. f 260 C ns. cut. C. e. f Ch. n. F. pt. c. Ul. f th. Duod n. m. A. S. f. 945 583

This report bed n 6 pt ts per t d pon by the ath had petetch qhhwsbdn tannt meandphyo log cal on de at n th t ombs sity nd if cocy mahghrdegr thath mor a reat andal the adelpr de All fthepa t twe privat s dthywr cat ted

ry s months t det rmine the thenp es at con dito In no usta cedd ny pat ent lalt r no t The at onale of th op att e techn q e was

T remove th m t cti p rt o f the st m ach fom the st ndp 1 t f atr ct hts nam h th pyl ca trum and th funds upt thicu a gul r By this pro edure the dist m lating po to n of the gast cm c sain the pol reantrum as well s from on the d to o hif f the aci scetng muc a fth fndu wa resed Th r mo alof the muc 1 th pylo1 a trum t kes aw y the gastroh mone g t maj rfact rinth stimul to fga t sec eto To re this h th ptin ty of th g toit taftret by natel gastorer not m

tha la gestoma 3 Tond cfe gat of them 1 gga t c e ment with the lkal ne duod al cr ton b m a softh s P lya type faca tom a dp d c

am m m cut ali at on fthegati c nt nb 4 T de ert the fi f gastr c o t ts f om th ul barg port n of the du de um into the 1 10 11m

e tinf ll ed by the nte The cort cof c gastr j ju o t my h s a lower mm d tem tlty and is It ts nyf th s rg cal pr c du behmyb to sryath rult fp topera t c mpl cato s Th a th appa ently d th titis n c sary to perfirm t ne resects no all pat tow thip pt c lc du d n m beca s all but a lt ly mall p centag of the case a e at factor ly tr t d by c ers to r s ct on with a l w r imm date m r tlty

The pe ativ tech qu on isted of midline c on to locate the c mm n duct t ts po told appea a ce bh d the uppe pat f the and portion of the d oden m. The lite st c eset ad the ght vagu nerve r dvidd that ves is in the gastr hepate and g to le Iga mats swiff sthe dud n h pat c nd dud ocolclg ments we d d fly lamp d and 1 silk Th gment I the st mach to m ed was next clamped with tw P yr cl mps thathepylo: trum pylo c plu cte and p t on f th I ad t th stom ch w e rem The tump of the d denum ws cled with t lyrs futr d th first tu ws c t ous one with O chr m c catgut. After the first utur was place the rush distigethr th th clamp was em d The ec nd s f utur s wereint rupted H Isteds t offi rts the hist cont n s sutu I ne A a rule they wee tat dm dilly adcata dlater ll Beca e of the r lati ely sm Il ment f stomach em d hotlp stcolegatrjejn tmy uld b ad ly p f rmed witho t th id of a et nt ost m This was sh t that aft 5

tr fthe int tn t th d fth st m ch th dst n bet e th I gam nt fT tzadth b g ng fthe gat 1 jun la a tom 1 th les cur at a might has badth

The esults ho ed that 204 pat ent r 78 per nt sho ld h reg ded as well 30 pat nts 0 2
per ce t ha e been be efit d nd 8 per cent vere
n thenefited The mmed t mo tal ty was 2 per c tw th nod aths occurr ng 1 th last 160 pat ent In a mmary gastric resect on a considered the b st method av ilabl at pr entf the tre tm nt of the comt leat as of ch on pept c lee of the d de um Itisn tid al hutitisrelat vels better than

I see tens ve su gic lo c dure This report was mide i dir to erve as a hais f ther compa n and st dy It has evol d from a search for g cal proced e wh ch com hn in the highest degree b thisafety and efficacy

SAMU J FOG LSON M D

Holland r F R nak S C ip R and Ka 1 tz R F A Synth tic P edigested Alim nt f J nostomy F di g S g 3 945 7 754 J n stomy is u ed (1) sap llat proc dure

f d gpt nts n whom oral feeds gs are e th r diffcult rimpo s bl such a p t ents with inoper ble ob truct; n of th esophagus st ma h ca d by acute inflammat o or m ligh cies pat t ith i ant n cau d by pern cious vomiti g of pregnancy () as p lm ary pr c d re in the tratm t of te s e g st d den la d gast o ) yo luke t n ce mp ed by m rkede dence of alk loss nd ref etor; to med cal tr atment (3) as a p ophylactic measur f r th rel f of c tain p st pe tive compleat n f llo gs g , f th stm ch such as gast c dlttn ndd d l fst l arising f m s t e insufficiency-the ieiu n st my be g compleme t ry (mad co need ntally w th the may rope to ) or suppl m tary (mad ubs q ently t the operation) nd (4) as a d fi it p ced f p imar; gast d den l lec Irm ginal lee ec ndary t g tont tm3u which was in vogu f a tim but ha

lost is popula ity

W.h jejunost my va first mpl v d t as acc mpanied by ce t in p t perat e mpl at th los fintest 1 cont to the gh n mpet ce f the j j nal st m th pers t ce f f tul fte withd wal fthe nt t myt be thef q nt ccu ce fi test n l bt cti d to tech cal mperf ctions oc at d th the W tz l type of jej n stomy The e diffi litte h h ated by imp or ments a the u g cal tech in th raon f th ppl itv of ) n l lm ntat n asth dist t tig mps derthe dent t which fequal) ccompaned t It has benge e lly cc pt d that the d stes g gastr nt c mp t ms m y h caus deth by phys cal fa t rs by g p f d t ctly chem cal es Th m ld th e symptoms h ve h en cl ly ass cuat d th physical f ct rs lke the timpo ry engo gem nt f th m lt t with food mat il The ar as lope t dhy e nt ol fth rate fd p dmm it in ithe th an fi ent d p ppa t motor act ated p mp g d vic The importance

of unemul ified fat in this connect in is particularly marked An excessi ly high osmotic p essu e may also be a cont ibut ng factor to iciunal irr tation s nce it will require cons derable t me for the small bo el to d'lute th aliment sufficiently to prevent esmotic tim lation of the neuromuscular mechan

For jejun I feeding the alm nt must be very easily digest bl or even p digested This is n ces sary becaus In any and gastric digest in are com pletely 1 m ated and p creatic and intestinal dest nare dece s d th latter s a consequence of the dec eased at mulation of the correspond no glands and the red ced t me of contact of these ecret s th the aliment Exten ive p ed gest on simportant lofo a ma mum fahsorotion Any f riors which may arritate the bowel must be e clud ed from an enteric liment. Its oH sho ld he about 60. Its esmotic or ssure must not be too much above ofone ty si ce the educti n in this property which normally r sults fr m d lut on v th the d ges ti esceti n afte al feeding i great in iciunal alimentation

1 m at the afo ementioned drawbacks of i iu ost my feed ng the autho's s gg st a nev formula for sonth top ed gested alim nt Inc n t ast with p vious f rmulas emphasis i laid upon the i c poration of p d g sted proteins the ma ked reduct n nth f t content the use of p tially pre d gest d ca b hydrate fr e f he e sug rs and the tibe I upply f ssenti I salts and it mins E ide c f the efficacy of this nut is t mixture i las d n 1 c case in b dy eight and absence of

amps a d d rrh a specifically associ ted with its dmin tration t e perimental an m ls and pat e ts
ith jejunost my Furth mo e it has b en shown that th occa onal c ence of unto a d vmpt ms e vom t ng nd d st tion can be elim

ated by start gthe rate ffeeding at 6 cc perhour d grad ally a creas gut to a ma mum of f om 50 to 200 cc per h about th fifth postoner t e day the speed of ce se and the upp limit being stablished for each pat at individually

The mportance of st liz tion f the al ment and th d pappar t sisd cusd TO HK NARAT M D

ManCN Wunds of the Cln Bt / S . 945 3 337

The tudy is an analy 1 of 128 w r wounds of th e lon m mly survivors Ih right t asverse and I ft c l nappe rt have been njur d ith equal fr q ency Th f d port as f the col n were m t commonly 1 ed hy mi le entering from the back whees the cum a dt nsverse colon wer ually inj dfr m thef nt Of 56 patients with pen t tngw nds fth col nsurviv ng fortwenty

ight days or long o er o e third we e ope at d pon ft t me l g of mor than twelve ho rs one se enth after a tim lag of more than eighteen hours a d ne leve th eco e daft a preoperative d lay of t e ty four ho rs This indicates that in lat

cs fg ry may i d g d res its mo coit than i g ne ally eld Am ng survors p t d upon thin sy h urs ther wa app d nce i those ith inj ry t the tran erse c fo

he as am ng thos prated pon in the see and si hu perod the same rk dfllnth num be i u fllning injert the segment. The isdeprib bly to the fequery fee er bem

hage! with deep n i asculrmes nep me cl n a dome tum and fr m jury t hr abdom logans Th b tter blod upply of the p mail ln n dibe freq c f there blom and number case the skew of the test of the descenling to and hill the distribution of the descenling to and hill the frequency of the skew of the descenling to and hill the frequency of the skew of the s

In 7 gad to ope t train nt of th 1, red clo trr sto f the damag d pott n hen posbl th s fest p occed. Although it is bette t br g the gut o th ugh th k: a gent cas with a hrt lop tt sper to cal at on may be chi d by sut the 1 jured c into the parteal per to e mad all a n th and mal

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JOH L L POCT MD

Cae H W S gl IE pelnc swith Ulcerati Coliff S t Cl V 1 cr 945 5 3 The object fth pr tt n first t d sc c t n mpr s 1 s and c o d t g e som de

tail deteched uggst ms ndwr f the ptf ii hin huyte onteed in the treatment full twelt. The thobse his start me ts he cpenes the ptits up help per f med pato These grin i dludent 63 prin th 8 death n pe at motal

fgsp ent In the first t 3 rs of th Athre ere meg y p at on th cut f lm nat gsta fth d a th 8 d ath a oper t v m talty fsaper e t Thef tles I ed sth th tip fe e huld not ha ad is n fth f teambeau fthe dbltt ie to m hm tha Lat 5 ilotm swred 4 de ths nope at 1 m tlts of 8 pe c t In dd to the r 46 ubt t l ol ctom ths d th noper t em tal to of 8p tale I time the d than operat met It fipectad81 gmdtmcadicom bindabdmnpil ct wth ftl te ft mp tuttok th t med cal tr atm t hasp d nad g tewh n thep c hs chd th t g of r ersblt Eal derso of the feaf tram hath d s f the 1 ty th t will proced to takahlty hild be mplid m found! He itsdffilttdffr

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ad() the hm the deach spod f at thandrems a bt whmth trd d a d Thel tte type fpat atc libe pa d pol gdli dl fcln lileost my performed the alestob fth despo ddo ert thithdas spr se nd cn the magd mdcally Il ost my m h more of isk thin ubtot le! tom; I 6 1 st m sth f r d ths m t lty te ! gpe ce t An tabl f ct th t may fth" pt nts follo 1 1 tmy nd btot lc le tmy h m ed ll thut potet my Thid pla ft tm tfraptet thafrda ed le I gth t l n and t m first btot I c lect my w th a il t m nd th

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McPh rs hrs AG nd knm nth JB Acute Appedicklad th Appendi Msfil Acute

S g 945 3 365 The rtil anal 3 es facut appe de cit t td n St Th m Hosp talf m 937 t nd m ks c mp ison th t imilar les f m th m h pital mad o a forts v rp id Pit cular tient d wnt acut appendent ithm fmt Th litl f ct th trm appedxm ith lt tu a if quntly it confel that the polabes Bapp dests with ms the a th m n cl calco dtin which the ld ti n to the ig dsymptom f cuteappadet mas the ight il clossa hehi pal pabl tho ta esthesi. Sm f thes me ma ct sm p o b come l k ab cese whl th rs c n t f n f m dapp d's Hed off by fim land dmt s m nt m m terv and c I I bow I Th uthors bel e that th p es n iam ind cat an att mpt on the pa t f the per t n mt l cal ze th infection and f ths tt mpt apperst besceed g the cas strat de r at b. The lacal fidgs the than th 1 gth 1 th h st ry dec d th manag m nt Ea ly caes r t t d by imm d t perat n nd v h th v dence gg st g sp d fifct no f k dff pentonit at the tm f adm n

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n t t le c nfuse l th the Ochsn r method of treatment s hich is ppli dt cases with general p

Patients 1 ith a m ss ar jut to bed in low Fo 1 e s nos tion s dative enemas or aperients are allo d fl d in small am unts only at given by mouth and the h lf h url pule rat is ch tel I deate sf aban long cons reat e treatment ng pule p isi tently el vated bul e r te ncre g s gn and vmptoms sugge ting a se e d f ni cti n b ce i mation (at a late tag land a n lly a falur tors ly Con ervat treatm nt i n tad ed for child en th ag for np egna cy les a ry fi mandlocal ized m s sp & pt on adm sion and th is u com m n in th e types Interval appendent m th month aft r 1 t n f the mas re ommende fr tho e case hich ha e r p nded to conserva to et tm t nl ss ag th general cond t n of the nationt 1 c nt nd catio

The sicas i mpleacut prenderts

oo ith diffu ep rit nitis and o tham s Th mortal ty rat n smpl ppend cits as 17 per c nt n co t stt soprce tin cases ith d flu e perit n tis Only r pat c t n sh mama sh dh en felt b f e perati died h ch gave a figur fo 8
per cent N deaths f llo dint r al app ndect my Cons reat t tme t a ah ndoned in az case The time pent in the h sp tal a g d t els nd ext nth las as mpleapp adct th ty and three te thedays gine alpert itis andth to two nd et the disfo them sea rt ming fo i I ppend et my It sag ficant that alth ugh alngrh pil tav gird th mascas nly ithe epat t ! hand the de thi llo ed pe t nf ap d cal absce s Th l est mor t lits occu I th mas cas a despit the f ct that th a rag h tory long factor h ch was bl d to is the mortal ty The p c ntag of ftlcmpletn al small stinth m ss Th m t lty ate for the ent es ies f 730 cases am utdt greet

JOYL LI O ST MID

k T B nd F ri F M Appendi iti Th 1 5 g 945

The auth is r po toft y is feeper no ith a te pped it am nepal inst tut n rr t l' S hunfel d fifty-o patent ve pe telpnlng thef t year p rood nd th ut the ot f the lifo m les wh n pefat n had crd D g the legy t year pe od 500 pat ents we e pe ted po and If m le adm n st ed top calls at the t me f pe ation f pe foration ex t d Following th perat na liathia I was go no ally inn rly ff f ucf ca es Th m tality atew lower in th Itt gr p F the cl cal nd xprment lst ds enec

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#### LIVER GALL BLADDER PANGREAS AND SPLEEN

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Och n 1 1th h p tex a ned ntal finding nto 6 these ces p 1 aby the authors ntherem a nga 4 tiplay d major role nth lless The cel 1 n n llea a de toth mboss O cl ston of the h pate in may b prim ny rescondary to inlammat ve th use of nep sted dease 1 th l th ombo of the n inghbo mayen ca at d ases n h ch th ombos s cours fee nul ch polycyth ma na and perhaps the slim grifted from the limit of the number of

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The autho has r e ed 33 ca es f cute ch I c) titi The rat f females to male s t Ch I cyst ctomy w s perf med on te is with a motal tyrte of 35 per nt and ch lecy t st my wa pe f rm d m 3 patents
ith mortality at of s pre nt T oh ded ad thrty naeptet (70 pe et) e ob er df a per od rang ng fr m n dyt fi weeks after adm son befo operat n 4 fth s ded which gave a 10 per c t m thity rie Ninets t o ca es (30 per c nt) we e ope at d up n o the day of admi n with mo tality at fs4 per cent Cultures wer take n 28 ca es cent w re rep rt d spes nt ng gr th bacillus c l as fo ni 7 t mes the st pt c ec v dans 23 tim the bac lius elch hemolitic treptococc 5 time the taphyl c c us au us 7 times th pem occus 3 this the h m lyte bac ll ubt l 8 time alth t ph d bacll 1 t mes

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McGuig n W J Acut Ch l cystitis A Comp ra ti Study of th Mo t l ty Rat aft r Immedi ate nd D lay d Operati n Am J S g 945

Och ndrdadtety thr pt nts thacut chol ysut he met oper ton the Haz lt St t H pt l fHz lt n P nsyl and gth patd cade The ewe 98 fem les d g m les th rages and f om t nty on to se nty years the a e age ag bei g forty s x and on h lf ; ars All cer ed es ent ally th ame preope atr e t eat m nt morph ne hypoderm cally n c cap t the abdomen a d parenteral inf n of gl co e soluti ns to c mb t d byd t n and fort fy the l ver The postoperati e manag me t fall w s also m ilar m ph ne for p in nd gl cos s luti ns to ma ntain th wate balance and to supply sug to the lr

lo th pu pos of c mpa at ve t dy this m t al was did dinto groups cc dng t the lngth ftm elps gbtwe th on et fth sympt ms and th oper t n gr up I mpr ing those c mi g to one t nyithi f rty eight h rs aft r the s t I the tt k gro p II those comi g t op ratt n bt enfoty ght and ety to hours grup Ilfb tw nse e ty two and m ety s hours g p fl b tw n ninety and one hunded t ents hours gop lbt cen hu dred twenty h urs and seven d s and group VI between ght and ten days These g ps c mpri ed respecti ely 17 20 4 3 and 17 p tie ts Se nty t o ho rs was arb t ily hosen a the di idi g poi th t n the immed ate pe at n (within se enty tw h urs) anithe del jedp d' (aft rs v nt) two h re)

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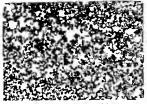
Bica e fth educt nnm talt t sno th pol 3 f the H zelton State Hosp t lt teat ac t ch l cist t e pectantly a d hen the del s es it in mp ement of the dition of the pte t eh l cystect my 1 pr f rred to h lecvst tom; and s em t be hetter b rne than th less ra l cal oper atinihn ti perfom dimm dat h Il wvr th policy affe ble on if the p g es n l s) mptoms d signs the is f the is d l p g es on fi f ct as sh n by inc the l cocyt count the puls ate d

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Catt If R B P nere tod od n l R ectl n \ E el d J 3/ 045 3 5

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f m tastales t p tient had lement fth dihl teng p me ente ic v s l tumo that could be m d locally fr m th ampulla In add t n 3 pat nis e c expl | 1 t th c nd t ge ndaft r th p creas sfr lno f dandth per tion sd c nt u d The smn 15 om nah drientth completed of t d la 2 f them e ttenfotvadfttfi e ſ g

Thep sat g vmpt mi 6 ac asjunic dn 2 ema of e pla ed org Oly ptints dd not hav a 1ghtl Ocjat th rmand llf to vea 5 for 1ght nm th 4 fran a d3a emg ic dt n hav gt pe at d pon that the jat a la pate t h dan tag p c tol denal e tion ith 1 th the t tgrocdrw mplovdin 3 t nts the dath am et lty te f ent Topatentsh del eq tila g the h pt i ight nitnm th fli ig p tion espe tiv 1

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and the authors meth d of taplant g the panestic duct in the jej num. All an stamo es ar nticol c. E. O. L. TEME. M.D.

#### MISCELLANEOUS

Dixon J L M tn G nd O h n A T at m nt ol Abdomin 1 Inj ri Re ie of 89 Pers n 1 C s A J S g 945 63 43

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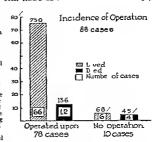
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### GYNECOLOGY

#### UTERUS

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EDW RD L COR THE MD

C hman B Z Hy t rectomy with Preservati n f Ovari n Ti u in th Treatment of End m triosi Am J Ob 1 945 49 484

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of ag Of 26 patients howere less that enty fieyes fag o had chocolate cysts of the ovary and 6 had endometriomas a old abdominal scars. The others h d endometral implants on the perto

um or sacrouterine higaments. There were patterns bet era fifty in dis ty years of ag. 30 them we rest II m instrust ing and these had adenomyous or adenomyous of a denomyous of a denomyous of the utrus. The main ag 7 we past the menopause and the op rations were done to other conditions (ovarian cysts [mailgnant and b n ng] pr laps sute and 1 g nulosa cell t mo f the ovarn) and local zed adenomy sis of the interns as 45 of

One hundred and ninety four patients ere mar ned and 137 or 705 pe cent gave a hist ry f p g cv O e hundred and twenty eight or 66 per cent had child en and the o others had had mi

carriages Se enty seven w e si gle
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ounger goings when if e di case was not advanced
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used in 5 an inc d nee of 28 4 p cent of ov tan

ablat n

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t ssue was done in 85 cases o 54 8 per cent a d in

o cases the ut rus lone w s rem ed

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M ig J v The W rtheim Operation I r C rcino m f the Cervix im J Ob t 945 49 54

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figure f 87 7 p cent

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### ADNEXAL AND PERIUTERINE CONDITIONS

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ED RD L COR. M D

### EXTERNAL GENITALIA

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H B FTH o MD

### OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

M ssey R D Randall L M nd Doyl L W Pr gnancy f llowing Mty m t my Am J Obst 945 49 5 8

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Pr t in D fi encl s in Pr gnancy J Am M
A 045 7

The p ent comm nicat nisch fly an att mpt to answe t q est ns () what is the ince den f p oter defices the ult fd etair nideq ces d (2) what is the possible ff to f chd fices the moth and chld

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hgh mtelligene rath n eas n is licrocome to cope of the state of the det of the state of the sta

It is a furly mpl m tt to d t mine th inci d ce of p tendefic cis n pegna cv the e It f d qu t p t n intak H w t d t m ne th poss bl ff t of uch deficie es nth m the and child a mor difficult Fo natance i ddt nt the i tru n to th pct e of such in det minabl i ctors aba mal ab rptio a d tliz ti n of th ing ted p teins the m e com plet the ton fpr t with nihe b dy wh th ntak siwadth cesddem ad ofpg a c th is add dith lick of method fo dit m gth pot n tent fth ts wh ch depl t d reserve may escap otice a d th ind i int h cter f the res lts whichf llow diq ate prot nn t thon when ( le s a d monst bl hypoproteinem de l ps nd d ma us es) the ma festations m nt t littl m e than a slow and ns di u wasting away f ll th t ues ith as o-1 ll h 1th cat dwe kness ndg

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to fthe blod tim dth p t na nated
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the pool at ke was cell t { gm per too
the pool at ke was cell t { gm per too

cc) In the type of anema the administration f r n will he witho t ffect on the an ma until the p ter d fic ncy al is corrected There is no i st c of eclamps a n the series how ver the b gb et cd nce of pre-eclampsia wa in the d fic ncy gr p Th xperience p ed the fallacy of the hah t of tr ct ng meat and egg 1 the d t of the gnant soma which sas generally practiced in th past and s still p acticed in s me quarters at the ree t t m In the past too much ttention w f cu d on ob t tie c mpl cat as and abnormaf t sa caus soi m tern la dietal morb dty nd m tal ty and to I ttle attention paid to the general n titon fth patent

The ew no mate nal mo tal ty in this e ies but a gn ficant rel tionship wa found to ex st het tl mat rnal morb d ty and th prot n c nte t of tl m t nal d t the m bidity in the deficience p be g fi times g eater than n the xcell nt n The fetal mortality including stillb the ne atal deaths al o bor a s gn fie nt rel tionship t the maternal pr t 1 1 take the perc ntage of f t I mortal ty fo th five groups f me celle t to 1 ry poor be grespectively 0 22 0 4 and 55 The grate we ge mat rnal gan in weight during pr gnancy in the d he ney g o p is expla d by the tend y toward h gh; gestion of carbohyd ate d I t wh n the protein; t ke was l and ggests a I thigh in prite for the rist ction and reduct a of w ght dur gp gn ncy Th ab ence of effect n th a crage f tal weight at birth s pp rts the sumptio that the fetus in tero ; a tru pa asite nd e pla ns why the child a buth we ght cannot be con t ll d by any known d et ry m ans

r ults of iner ased pr tein intake in this series come i mastudy ith protein e asumption fasm li gr up f ele t d pat ts wh m nifested e ide ces of p ot n defi ency The p tients we e dmitted to the hospital in the last trimester of piegn ney be cause of mass e ed ma of ob cu e t logy Furth estigat on showed the ed m in all fthem ( ld sh m It pa a) to be due to a b ie p otein defic which I ft n doubt that the tendency toward p t 1 m l ut tion is more likely to develop n lder

H e er the mo t striking cont mation of the

wmnadthat tis ncreased by the stranfe p ated pregnancies in r pid success on In all these cases c mplete rec very ensued on a egimen based o ep ation of the pr tein d fici ney
The thors find the t the bet me no of repair g

th p tind fic ev (a ddton t such a high blity t three oral feedings) is rep ted a ly blood tansi ns blo d t n fus n suppl m at d by mino c ds t c rrect the an m and It tra fuins with plasma r plasma s pple mented by mn a ds JOHN W BREN N M D

Q igl y J K. Habitu ! Ab tion im J Ob ! 945 49 633

Pio to the present tre tm nt of epe t d b r the ca e of this condition was I mited to m inthis of absolute bed est. This was often ineffectual as omen abort d during long imm bl at

Th husband and ife should be subjected to inve tigati n as painstaking as that u dert ken in the d agnosis of teril ty There is a correlat on be tween these two conditions Women ho are infer tile because of ovarian fal e a d who laf r con ceive oft n about as a result of the cause of th ir sterility Appropriate treatment hould follow the d se w ry fany possible eausati e facto s The c ection of a ret od spl ced uteru is best done b f r conception with the fitting fap ssa Too much man p late n of pregnant uteru may caus ab tion In the major ty of cas s howe er no local causes are f und and the managem at res le it self into measures aim ng to c ect def cienci s of endocr nes and vitam s The patient should b in structed to refram from x rt on on the days of h first 4 missed in instrual per ods. Int c urse should be interdicted to four months. The entir subject sho ld be carefully aplan ed to her she should be encouraged but no abs lute pomi e of succes should be g en Becaus of their int use le ire for ch ld en these pat ent are usually co op rat

Progest n is g en by int am eula inj eti n 5 units ev ry four days after th first mi sed pe i d In case of any ble ding or p l ie pa the pati nt should b put to bed and the f eq eney of th progestin injections nereased M rph ne i not in dicated b t simple sedatives can be used. I er. al. administration of anhyd ohydro yprog ste o offer a mo e conv n ent m thod of therapy Hamblen b I eves it to be as flicient as the int muscular inject n of progest n So le krohn and Greenblatt conc r in th Still anothe meth d sho ld because of it simplicity and economy e further trial-that of pellet mplantation

described by Mishell Inte rupt on in the th rd t mester of preg cy in t ted by contractions or rupture of the membranes may b du t th prepon derance of e t g n P ogest n and cated and may act as an antagonist t pr v tp mature labor It enty e ght of the 30 w men who

ab ter t nt to full t m or n r it und treat m at and g v h th to normal child en. Ute me tt g w s d e m 3 ca es a d m 4 case thy roid Succ ssful t rm atin of a et ct va g pega ncy teat dp phylactically aga st bort n d e not gu rantee f ll te m in a sub eq ent p eg nancy that unt eat d Two po ble fields for f the invest g t n as t

the caus frep ted bo tions are ( ) the qua ti tat e r l tion between the est gen and co pus lut um sec et ns and ( ) blood incompatib lity of the husb dadwif simlrt the Rh factor in crythrobl tos

While the e ome q est nf om e p mentalev st the valu fp oge tin to p eve tab tion the a tho believes th t the results rep ted by m ny car ful ob v rs wa rant its cont nu d use at le t tl bett m thod is olv d

E ADL COVIMD

tr t d cases might appea to e n t tute com neing pr of of th effic ency of tmak btath rugh analys e caled that th higher mortality rate n ser es D s d e to the p eponderan e of those factors usually asso rated ith death of the infa t rathe than the lack of a tamen h

The auth is de the intermuscul reniect on of v tam n k in all inf nt so n after buth f r th pre vents n of hemo thag c disease fth n wborn

E TS E AR THE M M D

R senthal S R Bl hd M nd L sl E I Ten Y ars E peri n c with BCG (Expe im ntal and Cl nical) J Pd t b L 1945 6 4

In a study of bacillus C Imette G & in v In a study of bacillus C. Imette G & in v in at n in which p c 1 emphass wa placed n hav g adeq ate ntr ! nd in which the mult pl runet re te haig e was u ed t introduce the c cin the following re ults w obta d

The vace e has been fo nd to be nt ly n nocu s b th locally a d gene lly n anm ls tud ed over a peri d ften 3 ars nd 302 e to n infants which we e obs re lov a perid of

seven years

2 Am g 24 a c1 at d child en with no known surce i copta t with tuberc is three sere a ca es of th culos a did ath fom the disease wh eas mong 1 2 3 ntrols the were a case f tubercul sis and 4 d aths f om th ds ease Th I llow up peri d was I m th ee to eighty f ur months

a Among of coin t d newbo n nf nts fo wer in cont ct with tuber al is f flowing vacc t nth e as re of tubercul is nd no de ths whereas amo g 63 cont ol three wer 4 cases f tub reulos and 3 de th.

4 With rig d to the cont t and monco tact no pasa whol the e er 27 cases I tube c los s the tolgrupagantacas the cented ni the w 7 d th form tubercul is in the c nt olgrup and n the a ted

F om these res Its th auth is concl d that in the first en yea s of l fe bac llus Calm the Gut a acc ato s fd fin tey le th pre nt on of tuberculos s

The uth rs r c mmend that the b nefit of the

vace ation shuld b gi en to lich idren l vine n highly infected t b reul us a e not ithstand g th abse ce ftube ul si i th ir mmediat ho h ld Wh n tube culos known t b pr nt t ct of ton s th other infection d ses sh uld b pra ti ed In oth wod bacill Cl m tte Guern va c at on shuld b applid a any ther typ of accuation It; lik ca w I contact is espons bl for the gr t m i riv ofifet usdes ErrEA men MD

### MISCELLANEOUS

Hutte M nd Pak J Th Tran m P nicillin the ugh the Pi c nta Am J Obs 1015 40 563

One hundred th u nd units fpe lln 1 1 td nt amu cularly into the pregn nt pat ent at t m ill result in an ad quate b eter ost te pe icili les I n the f tal c culate n The a tho ha no dat n the p s g i peniculin th ugh the p centa f th pati nt in the first reeco d tr ment r tp egnancy One p t nth d po ti blood i go but a n rm | ppe r | pi c ta An th p t nt had m d ately se | p e-ec mpt c to

ma with milt pl small placent linfarcts

The fact that p i lin ps es fr m th mat na into the fet le reul ton n effe tive co e nir t n ugg sts id the rap ut applic to f to ly no toxe gent fr the co t ol of p. col s sent bl nie tins which fict th mith a d h r unborn fant Of these uni ct o should rece gr atest on id rati n If pe Il rad cat syphit feto nthem the nd ft sitsheld epi them chem to re ical propat n th t atm nt of sight E n cen n v L C

### GENITOURINARY SURGERY

### ADRENAL KIDNEY AND URETER

N tin E F R nal Ectopi A Study of 23 Am J S g 945 68 67 Cas

Ectop: impl s congent l d placement Ren l ectop a may b f ald gres and types There ar 3 g ne al level hich the di plac dkid 3 may ccup) th los lumbar reg on o ili c fo a the br m fthep 1 o thele elb 1 th br mofth p 1 isthe treplicked v The I wer the kidey the nea er the midle it ully les Ectop a may be u lateral or b lateral Both k deys may ccupy a pelvic post adb f dt fotma cake or hld kid y e fthe estf ms The kdey m v be d Ilcd to the opios te s de of the b dy f mits n turl post on Such a kid v m y then be f ed th or l dst l t the othe Lidney The scrosd ctopia i edo niu d the form r b g m h m e common Studes f a s autopsy s 1 1 dicate that the cide ce of ll types of r al ctop varies f m in 500 to n 500 aut psi The cl n cal i cide ce is much g ater Tw ty th cases 15 top ya d 8 clinical re p ted Thes w f the foll wig types lumbar

rp ted Thes w 3 (3 percent) il ol mb r 4 (7 4 pe cent) pelvic ra (5 perce t) a deross d 4 (r7 4 perc t) Of th last 3 \ f ed a d z w unfus d There

was instance ach of s lita y pel c kid ey and blt lenal ctopia

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males d (43 5 pront) we miles In th a tops ed ser es ren l et pia was 13 per c nt m e c mm in fm is tha in male (corr ct d f gr ter pe ce tage of m le aut psies)

Them j rty fpate to ce cli ically ind idual 62 5 per ce tof h mw reu d thi ty

years of age The ght a d left kid eys were

ab ut qualfeq ncy 1 5 ca es (2 3 per cent) the e w r ther con g tal abno m l t es of the t p c k d 3 and 1 4 cas the wer cong ital lesions of the oth r kd ey Thr f the glesso wer se i

Pa usually in the low part of the abd men or s the chief omple int. Nephrect my was d eng (375 percet) of the clincal cases of enal t p w s ppa e tly c mp t bl itb c mf rt d good h 1th

Ulgcal tul shold be cald out cases f il pati nts wh have c ng ital ab or mites fth gntal gns

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ey N S a d K t hm Pr gn ncy J Am M A 945 8 4 7 Il an y and Kr tschmer impe dwth the ed ct on in incidence of pyelt of p g n

the 1 t ten year the incidence of py I tis of pr g nancy in the Pr sbyte 1 H spital of Chicag nly a pe ce t This study c mprised 98 2 d

Dil tate n of th kd ey pelvis and u etc 1 not considered by them to be a major factor in this d's ase in that the same auth is in a previous tudy found dilatation on ntravenous py log aphy in oo per c at of the cases seen duri g pr gnan y and the puerperium

Th auth is ble e that pyeliti of pregnancy is ape e t ble disea e prevent on c nsi ting of meas u es designed to locat a de dicate foc of nfecti in the preparation of omen for spected pregnan y WI LIAM W SC TT M D

Lowal v O S nd Curtis M S The Surgical A pect f Cy tlc Disea f th Kidney J i M Ass 945

The uthor d scusse the vari s fo ms of cystic d ease of th kd ey ith pat cular mph is n the surg c I aspects and revie s 74 ca es of re I cyst cd se e adm tted to th D partm nt f Ur l gy (J m s B ch nan Brady Found ton) of the New York Ho p tal d 1 g the pe 10d from Janu ary 94 to April 1944 Of the e 19 e ca s f s mple renal cyst 53 of polycyst c d se e and 2 of chi ococcus c\ t

ley! The term s I tary en lev t S mple err n o s and should be repl ced by the term

simpl realcy t

Sif ctory esults will be obt ed n the get may sty of cases of a mple renal cy t by resect on of the fee po tion f the cost will a th ub equint phenol at n of the b e of the cyst a d cl ure of the resultant d fect with fat pad and chrom ribb n gut N phrect my 1 ind cat d in nly mall percentage of cases

M lignancy bould be str ngly s pect d n all r nal cysts containing hem thage mat ial and nle it can be d'finitely uled t n ph ectomy ld bed e as app ox m tely 5; cent of hem h gic cysts have been fo nd t be mal gnant

Polycystic e I d sea Polycyst c r al di ease a congental p bably lway blat ladpo

ive patholog cal entity S gery mth c nd ton spetty m chim ted t

the c mpl cations is gir mit Much can be done n p long g and maki g c mf tabl the l es f pat t wth p lvcyst c d se e by the mpl yment f a jud us med cal g men Neph ctomy huldbed e ly as a l fe sa ing m su e n pa tents who hav p lyes to kid ess

s yst f the kd ey R n ls gery 1

and cat d fo th g cat majority of p t nts with th ds ase At peration gre t ca e must be e c sed to pev t spill ge f the cyst co tents sin e ev an phyla which often fatal may esult

opaat myb nil tenthecutam nated ts IK t VD

### BLADDER URETHRA AND PENIS

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spet to ute te denomyom sp t for and by o R kl hausen n 850 he be ed that the glad diarnet is the time to the the the state of the lift and ut be caue f the morphole geal re while ce but en the h t logical true tr thade omy maad the tof th wolff a body

Vicispia: th., Th. rss. pthel al theory stated be lwan fi in. 898 and later ampli di hy. Wen. n. ny 4. b s. s.ch. uppo terns. My. L. u. he. Witherspoon and M. The theory be 3 do not heft et that then t. p. th. h. m. fi the fem le ge ital t. act. dr. ed. Jom the 1 mc. th. June 1. s. t. of limits. I feh. n. y. stato. flamm. t. n. su. g. al traum. or om. borton al. rmilus th. seco. (t. he. b. t. um. dere s. rmilus th. seco.) (t. he. b. t. um. dere s.

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adthr itsem to bgg Emmittadh sateh bendiappotd nthue f tometry dh bado dtu adgat ad Thbel thim acute I mine bobindimth pinth tybephyselandn logcal vam tb) det manin ith m nt fesdulun od by yoo po vam t

Milit r J R Pr 1 p of th U thra T ted by th H phurn Operati n A J Ob 1 945 49 59

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### GENITAL ORGANS

L tch m C W a d Emm tt J L Tean urethral R cct n fo Vi n Eighty r Vio Years f Ag J U I B lt 945 53 49

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The type altact utu ol raton describ d neonsid rabled t ! Rf e c made to b the mant! and d! It typ fhe na! a c t d th the udscendd t tel H na was e count din oo fth 3c se U N N S T MD

#### MISCELLANEOUS

Ryn ld LR nd Wyra h II M Ue of Pn cillin in the Tre tm nt f U g nit i in fection J U B bt 945 53 614

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BLADDER URETHRA AND PENIS

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F vs. L.C. MD

### GENITAL ORGANS

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#### MISCELLANEOUS

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# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES JOINTS MUSCLES TENDONS ETC

Hatch r C H The De 1 pment f Sarcoma In Bon S bj t d to R ente n or R dium Ir radiati n J B S g 945 7 79

Roc to no adum irr d t nauffici nt to cau e p hel l'chan es has he nf llo ed not inf eq entib by the de l'pment of re noma Although les common th n arcinom coma in s' fric al lec ton of a lat d'feld is also a well kno n

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fo earl rindepe de tum rs amely agant cell tumor of the tible a similar tumor of the w t and a cancer of the hreast To are chondro arcomas and r s a fibroarcoma with tumor cartilage in all of the cases report of nithe the rature except

theam unt f rrad at on w sl rge nd w sadm n were d n fract al dose over a long pe nod. The interval b t cen the irrad ation and recognition of the r ad t n p oduced sarcoma is l ng. The med an time in the report d cases was sx jeans

There is the possibility that the new temes is pest recurrence or metasta softhe ogenal temes I cases not then talles swere considered to being published temes to proposed to the idea to the sequent sare members are gional ecurrence latent metastas of the premary tum f

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y metastases in the same fild In cae 3 n question feg nlr curr ce or late t metastass can be and because the p many t m wa car moma of the beats nd the later bt m ehon dos room. The empte some d but ht the pot peraty irrad t n cas d th h hum cap mental the pot peraty irrad t n cas d th hum cap cap melly rlt y by ltil rrd hom was

d Alo therb ae a common t f chon was d mand h dos c ma whehmagral by ad t p d c vmpt m f al g t me II

e r thest r entgenogram made at the time of ma tectomy the gh not n w available w e r p red as normal it as prob bly more than con e dence that chondrosarcoma develop d in a rib within the fild irradit d for care; ma of the

The presence of chro c nfection in all the ca ly cases of precligen a rooma of bo e led most of the uthors to the conclusion that irrad attorn of chronically is flamed it is exast repossible for it mo formation. In the author's methal case and case a hestin on infection following ulceratin of the skin which was not considered in the consideration of the skin which was do to roomigen; and rad on therapy. The infect of time as many intradiated a different companies on the methal had not been affected.

It is true that occa ion lly maig at tumors of velop in chron calls inf cted bone which has nit been subjected to irradi ti n. These tumors how ever are us alls carcinomas developing in chronic ulcers or in epith 1 of sum tracts. Sarcoma for mation in chron cally infected bone nit posed to madiation, six emely rie.

One of the most inte est; g facts ab ut entgen ad um nduc d sate mas of bo e 1 the larg poportion of ca tilage form g tumors. This is true of sateomas poduced in pe m stall nimals as will as in human be rags. On his doss come of equ ntly amo g 1 di tion pod ced sar com thin m g other hone tumors.

JO NK NARAT MD

N via e J S Adh I Caps liti f th Shoul d A Study f Pathological Finding in P ri arti ritis of th Should J B S t 1945

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### SURGERY OF THE BONES JOINTS MUSCLES TENDONS ETC

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ne est which t mpo blt at qet th g a shold b p p dt pakthe What such p cd s ty gau mp gnated with petr I t m a d sulf tha I sed a dth dis ut edi l yers Th p ck myb fftinplcf k dth p ato may myb ompled at the nd tag VI esectin fth n 1 db ally perf m d i caes n hehith t m t t d th d ula fib f Wh th t m 1 g d n 1 es th thofm I ghag itsa qrd l ha thb truts db ngs g lly hta dt mth tba

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HIYGH ly GH nd Bck LW Cellophan in Bend Jint Sugry t JS g 945 68

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te h calo ea d ft 1 d tof 3 gofth in dadurgts: to

With early mov ments the sut r is liable to giv ay and vitb early splinting adh si ns are lable to form-c ns quently most of the cases whicheve ro thod has been employed have resulted in failures The princ ple of fi ation of the tendon ends until firm n tural rep ir has taken place a d the principle f m intenance of function by ct ve m vements s m t be opposed to one another An attempt bas bee m de t r concile the two by the us of a metal anas t mo ist be and at o-stag procedu e

The t be into b ch the cut ends of the tendon can b in crted s made of fi e gauge malleable none r os e m tal It 4 in long a dusually i in in d mete It is solt in it while length so thit it can b removed later and t has several holes p riorat d in its s des through hich s tures can be passed (Fig

) The tendon can be anchored within the t be by tures passing through the perforat ons on one sid th ugh the te don in the tube and then out through the perfor tio son the oth s de of the tub Lately a mod fi d type of tube with k ck ui pikes 1 its lumen has be it used so as to avo d th

use of sutures altogether (Figs 2 and 3)

Th t nd nend are l cated and th n th prox m l po to 1 pulled down as far as possible 1th th we t and fingers fully fl xed and tran fi d with a traght nedle s fa p smally s it i e posed Th seem to be the best way of hold ng th prox m l end with a min mum of trauma f ps el ble t cau e c ns derabl d mage to the tendon The pr fundus t ndon; e ential and the s the only neth t t ed The subl m s t nd n s c t way so as oid adhes o s between the t The subl m t a old adhes o s between the t

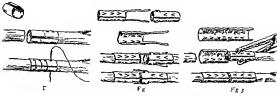
tendons apparently giv only add tional trength an I firmn ss of g up to the fing rs

In th w , the tendon ds a e pproximat da d

h ld t gether in a metal t be The straight through dthough sut es or the pricto prevint f ying fih te d andth neas ment in thit le t om te to ev ntsu d s ble adhes s to th urr nd g ti sue The tendon ends un te ead ly nth t be with fin 1 e cars and afte the tub s haeben em v d the un on is courate that it is diffcult t mak t whr the tendon h d b e e ed B nd f fibrous t ssue actually grow out th gh the p f tions n the tub and these hav t bed ided at the econd stag f the p cedu e h ch i unde t ken s m fiv we ks late Du ing th first thre eeks of the int lof five e ks b tw the tost ges th figri k pt spinted in lghtpltrs to allow u t t ke pl ce th t y tan th s tur lnc

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nd th tub r divd d and th tend n is l ft mplet ly fr The adhesi s are oft ngly dens but the ene element f m tal ound th t don do kep th st of ana tom ss f The dental sh th s n t sut dat ll and the



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so hild the tend d app um t d Them thod

d unply lad the pe dt be with then led ithm Thy m hely of the kep Inth wall tad be dthe the celly med these dtge ith d munth by p at by p up the lit

w und s cl ed by sut r of the skin o h. A niv movements r stat dine thay Atth st g thes can b d ne qut v gor u ly thout far that th tendon ends II me p t

Sof ply r cent injur have been d alt with by the method adf lipa : e mo ements I th d gits we e pre ent bef the op ratio S cas s r r ported

Tvo med an nerves we app x mat d b) a m la method the tube be gused to sur nd th n ry but th sutu e d d not p rf ate through th n rv thy were p t n w th v y fin small cu d needles p s d thr gh the ed of the sheat! f the nerveand th n t tb ough the adjacent perf rat ons of the t b on th same d and th n tedo t d of the tube

Plast r casts w e finally appl d nd at th s cond tage the rve had united will The e pairs b ben made too re priv to al at the ct onal espons

Sta nless at el has be ome the m t sal of ch ce because there is as omed clorization of t sead

jattoth timud The utho con l d that th r vits with th method ha e be n f 1 ly g od O f the a es of d as on f the fir pollicis I agus was a c mpl te succ sand the thra part alfal e

The te haical dt ib may rq e ight m difica t as a th fut P b bly the ut es will h d pensed with and the split tub with Ittle harp points poi tn to ts lumen (Fg 3) il be d nste d so st cause th minimum ft a m t th t nd n and p t the f rmat fadhes as e r th steof st mo The de Im t I han t vet he f nd but f rth xpe m t a be g md the o types ft ls t lad the RE PM TOME MD all v

### ORTHOPEDICS IN GENERAL

Leona d D W The S gn fican e f D 1 yed O fication n th T trant f C g nitsl C b fication of the true to I Pd t S Lo 945 6 379

Att nt on has b en call d to th f ct th t del s n heat o of the t ral b ne m y be nimpo ta t f ct n thoe ca es of clubfo t hi h b f ndt r lap e ft r o tinet eatm nt fo th sual l gth ftm An n l sofa en s fro ntg noer m from cas reco d has b n tab lat d and c mp ns ha ben made by the s of a prop ed s fication d x fo the foot The f cts th htain d nd cat that d layed os ificat s pres t an app ec ble n mber of the children hos teatme thanth ucssful by the peet c as r att method Medicat on w th this o d

ord r to acc ler t bon format on h b p g gested a a adu ct to the us al o tun feu g cal t atm t The cot edu f the os ific t der drig t atment his ben dicat das a m n of diman the edirm dest n th pr g ess u d t catm nt nd the ltimate p g

If the pocess to ficat the tars 1 b es hold the cle to the poblem fite tment fo cl bf ot a d f the t atment t b th ght of a first ac ret of the def met and e dape odof wating fith el ments fth i tt t th p shplke I gpl tic thi di idualt me hid le i s heat on s fp ima imp ta ce It ill n the n ght yf m th m at not exay n gat th t the al n mb of os f cat on nt s p nt t libe neces ary t sho tge g m that th nwctre thutdl ltht in fm hy peated rpe n mal t these e ters p gres ng at th

I'r the normal foot the a bt ary ages fo the extrem upp rnormal | mit f r the apr a ance of the ce ter of os ification e

T l C bod of real Hill t 1 řЫ Cun if rm I med 1 Cun if rm II N vicul

Calca

E ch f the e a b t ary figures which adm tt lly ar not a e ages m v be t l n as a borderl e age by nd which dlay is definitely path I geal Cl bfoot ppears at least t ce as often in hoys as g is It ha lso be usl n that the rate of o cat a a norm l ve ge in h 3s s slow r by
v I mo the than in girl A rel ti e slowne s of n m lo ficat th r f re found coupl d v 1th

arlaticlyg to nid c fcl bf t Tr atm nt 1 mo tlkely to he succe f lif t ted ealy nth childslife Thi f et is of intere tin the pres t st dy b ca se it d finitely places th of ti m mpe df flet tetm tic ned with the pe odd g heh mit to sufe tion of the b of the fottk place The physician is feed with not only rabl proces foss fication

d n g a most critical stag n th teatm nt of el bf ot

If repeated obser ations f the o sificati n in lex n case under tr atm t show normal ossificat on ag d prog osis can be gien the nfid n that the deform ty is n t s lik ly to r app aft the c s tion of acti t atment

Chome m tab l d turb ees e en hen ub I will that g the d of appearance and eta do lter th os feat n n the e nt rs Of all th metable d t ban s thos r lt g f m

ndormopathy are the most not 1.1 and of these hypothy ordism has the gre test clinical sig ificance Wilbar co clud d that calcium phosph us and vit mins ere imp tant food lements in bone d velopme t

E tens ve ch ng s in addition to d layed ossi fication in cases of hypothero dism emph i e th importance of that e docrine gland. In many f these ca e the b ne change reach an extr me d sig nated as cretinoid dy genesis. The e chronic cales how evidence that after the usu I delay in appea anc o sifcation finally develops from multiple

ce ters thin the single hone and mottled type of f cation is the result. Und r therapy with the r ds bstanc these abnormal are rapidly becomnormala d line ce ters that app and gt cat m nt a al on rmal

The f ct that thy d med cat n f r p short as six month ill bring about rap d normal ss f cat u uths sts hch tis e due may be borrowed as a b is fo the medical tr atment f any patient in whim diayed os fication has bin d see e d Thyr id medication i then indicated The natu I fears usually assoc at d with the use of thyro d substane n a p tie t with a supp sedly n mal basal met boli m may b d spelled by ac cepting the fact that d lay d ossification is in itself good evidene f a lowe ed metabol c te This finding stabl hed with x rays a theref re als an nd catto for the rodf e son unrelat d to the t e tm nt of elubfoot Medical tr atment for the purpos of spe di go s fication n child th el h f of the gh the per d wh n the bon sae beng h ld in their normal p s t n thus become a matte f giving adequat dily doses I thy rold substance with extra th am e chlor de which this m digat n demands and 1th th the etical ass t nce of det reh : ealeium pho phorus a d v tami A R P M TGOMER M D

## SURGERY OF THE BLOOD AND LYMPH SYSTEMS

### BLOOD VESSELS

Il nt J B ligatu f the Patent D ctu

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The tring of the dets t the patent of clato tin nith be this e daspop are the appropriate and a otto able che effithe bit rocci the patent me tale din

The operation that the tenth of

S n J H M sphy G E & N wm n E V Multipl Cong n t lArt ri en An ry m in the Pulm n ry Ci culati n B H J h H p hn H b 104 76 03

Acas f multiple g n tal art r v nous a eurysms i th p lm a j c cul tin prse ted. The dagm stabl h d by an no raphy as fim d at aut psy a d th patholog cal find s er p ted

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Hodg G B Grims n k S s d Schlebel II V T eatm nt f Va i V by Stripp g E cl i nd E ui ion 4 S t 94 73

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turbing infl ence of co stant low g of the o y g n te s on in the insp red a r

The polycuhemus as one t d with the anorems of high it tude is ab olduce in t pe. The list on in the total blood. Hime s d e to an i c sed red cill olium. The polycyth must be red in arr at at h h. littude seems due to factors of clase is red blood and hemo a ce t at in help the term of the polycyth o

The polycythem assect d the constantor in termittent an x min tend t show a proporto I I vato in the cirult r neulocytes and in the cirult r neulocytes and in the cirult bir robin This tim lat g infle end of no e ma on the hoppoetic system restricted t the finat not robinocical a 4th molthum Chronic ax mades not modify the rithropoetic act v

ity p rman ntly

Comparati e study if the placeth mas of high alt tudes and that obsert of at see led and as is that in cases of the latter due to pulmo any charges the polycythemir respons tends to be less than with corresponding of green of art rail very no unsaturation at high alt it des except in a soft Alperas of sease. Su hic mp at e studies alo u gest that the causatin in chis inno fopolycythem eras in trelsted to the exist in a one stimulus.

With the very ND.

### D G win E L Th Possibl R I f Wh I Blood Tran f ions in Military Medicine J Am M A 04 7 1 37

Sin e the nt detin f dum ctat 194 ct 1 m d cne has at dly inc a ed t u e of v h blood unt lit is c mmonplace in most hos ptals Blood has be me moe reachly at ble through the d'elopm in fill old baks ad it is commonly bele ed that d to ts ue b no em as are mp o ed p o p nemp pate is what a d op ration bit s m infections r cmb t d and hock firm s e bm cribage

o e come

Since og8 ttent n ha been dir et d to the peut pop n ille es plasma n de rumt us fu ins. These plama it nafus na a e fl etu th traitm it h pop tens ma and of expensive the ar il mploy di a mammenoth rapy shall the ar il mploy di a mammenoth rapy as a compan dis en distribution to the same and of expensive to the same to the same and the same

With the multars nees to fit at ng econdary hock on a lacale man opport nites from pargm thod of the pace and is beam appa e t that the meth ds which re from using common parties we e not no cessarily applicable a warfar. In e I praid the digress of shock as mild or moderate a dit iment can usu lly be a stituted promptly but now at the degree of shock is

Iten m cher afer sinc a long rt me el pses bel et t tnents stried F lu et recognize this proably acconts fr the a ly c nelus ns that ll patient with b morth gc sh ch c uld be trated ex

che li w th pl ma or serum

It is now be amuge of in that there are e.d. et et ell mell types fromodisty hock—ne in wheth mo one in this occurs as seen in birs a derush gij ir es and anoth r in wheth homeon e tent on occurs as in shock—cated the morth ge Sermin ad plasma will resto the it cultum olume a both types but if the blood loss his being aft the eight and my to a derjudies where the eight and my to a derjudies where the trium is decayatte so colled that pic of blood hild be girl for ery signs of erum plasma—n begrattens who ell homeon.

firm d in th Amer can fo ces

In cr than practic et the University Howa His pital a 800-bd general hosp tal with a blood bank has mag quant ties of whole blo d and plasma at all to not come of the second to the sec

t is will be undergoing m ) s g cal po d res not the end of e of econdary shock will go t In miltary m dic e op per cent i these cd ry shick cause are cad by him rrhag action p ferablite ted by whilblid

Frequently an wariare the ere many per tool. In at one to be fred? These of administ a stability and a create mp tability libeody? The man are will known. These fire to sem his to peferable trimer to feodoar shock, maintages at tons fit at; questo fiphamar at by Whilebild tamals no a comparted in any unflarny sit to be cause fiber ton it may unflarny sit to be cause fiber ton.

t may maltary st to be caue fither mr quredt collected od the halof d qutlytrind personal and equipment and the deficulty in pocuring d nots

Emplement fith fllowing the poculus has

mad possible the ppleation of who e blood transformations; in ltary in derection of the commistance of general person diblo depth transportation of perrol blood of the administration of grop O blood temporary of the problem of the property of the problem of the

A yone w rkin in lanhospital with a blood bink with lings piplies f while blood note it lably regainers the ad and green and the pote tites tim include ing These diant ges

mitpldmmytmes; d cdmlin

establishme t where surgic l operations are per formed on serio sly wound dimen by a limited per sound

Tanspo tation of p served blood no v is lim ted only by the distance att in d by an plan s in ted max mum time of p eservati of the blood. The U ted States Army as maintain pot system f typ Oblood in mour a t coast to th

Eu pean theater f perat o
Ottenbe g n 1911 p opos d the uni ersal donor
Ottenbe g n 1911 p opos d the uni ersal donor
n c ple d c n derable c tr v rsy about ts
f ty has been ar s d Rar ly a bl od of group o
my contan aggl t s of such potency t act

with a cep nt of a heterol g sg p Thou ds f transfu on of O blood be been given to re cp nts of other blood gr ups in c in n a d war pract cew th ut an 1 m gined need for actions. This is an immense advant gen milita 3 m d c ne The g o p f th blood can be d termi ed at the point of c ill cti n by ll traned t chinicians and then it can be emply jed as d crm at 1 yas plas ma at the point of administr tion without the de lay equipment or personn I required for the labora tory tests. N touly still sat me say r hut also it is sif t than t trust c mp t b lity tests done und the pesse of upe cy which frequently surrond the men ge cy transfu ion of blood.

M litary og mzation must sol crtan n w p blems i handling pres rr d blood in add t n to the problem of supply ng pl sma to medic i instal lat ons Collecting depots must be established far

gb in the rear't is e n adequate donor supply d to be eq pped with facil tes for ad quate
blood group ng R! geration mu t be pr v d d at
the collecting depots during transp tat n d at
th dispers 1 po ts accurat ly tim d n d seq
th aspo tation facil ties must be m nt incel life
to er now that the septoli ms a e being s 1 ed by
the Am canamy tisn who sublit to employ pr
s red blood of gr p O in the s m manu as plas
m adm ter ng tin f holes n amh la e

b rdshp and n the a

R TRB 10 MD

Th linim W T yi E S and Sh ub T S Th Tra f n of Centrif g d II m n Type f 0 Cell Res pend d d St ed in 10 pe cent Corn Syrup J Am M A 945 7 096

Resuspend d r d bl od lls l ft aft t ted blo d bas bee centrf ged a d the plasma with drawn ha be n t ed n oper cent corn vrup at 5 C fo as long as tw ty one day and adm te dw ths to factory results to 437 patients (f tie u n exp ation int rv l f fou t en davs bas be n establish di

Jau deo a y oth r del ter s feet has not occurr dand then aspecific fever chillecton rath screspoddn the dfer thospital t that f mth own bink blood

These trifugd cells weef d by ishby ggl tn tigtch qe t wefi d l ng in the cep nts i cul t n as while blood in a

de to citrate mixture which has been stored for the ame length of time and longer than cells in n

the ame length of the about the chinical to to c solution I sodi in chloride.

When Is the red cell are n ded the chinical re ults also indice to that tran fusion of ce trif g d ells resuspend d in 1 per cent c rn syrup is as

att fact ry as transfu ion of whole blood

Jony W B San M D

Mu th R O Conc ntrated R d Blood Cell Pr p rati n and Us S th U J 945 38 33

As a sult f the une eased demand for plasma hlood banks ha been left with large qua tite so f erithr cytes which ha been d scarted This h s resulted mas per cent loss of the tot 1 mat al c llected Attempts to util at this material have re s lted in the development of se c 1 new t chinq es Util zation of ryth ocytes

r R d blood cell suspension

a Dlt — Il co tequals that of hole bl d
b Concentrate—cell count doubles that of
whole blo d

R d blood c lls as s g cal d ssing

a Red cell sludge b Debydrat d cells (po de )

c O tment

Red cell suspensions are those n which the red blood cells are uspind d in s line solution to c c trati n ppro imating that of whill blood

Concentrated cell suspe s ons a e those in th h
the red cells a e pr s t in app oximat ly double
tbe number fo d in whole blood

The s spen ions are used as d s ngs for w u ds

Cells used for the la t purpose may b prepa d
on one of thre w, s () a sludg which is pa ted
on the w u d () the cells are d ied by lyophil za
tion and u ed s a dust ng powder or (s) the c li
are porated in an intent has Tragacanth
a d he yites rc | 1 h ve been sed as a base by
Mu y and Shaa

The peparat of the red clls for suggeal dess gas relat lys mpl l (con asts in removing the plocessed es d in the a thors ib ratory and p esent g a mod ficat used if it has p poss. The pat clust arra gem nt used all was the complete dry g of 350 cc of clls appr mately four hours and m kes it possible

to dry t uch amounts in on working d y by m It ply g the app rat s which is suffice thy simpl construct on t perm t l plication one may dry c siderable q a titl dally The p wder b s been f und very sat f ctory as a d in gor as

2 5 per cent of timent in a special bas co 1sti g f the follo g C tyl lcoh l 15 gm Whit t

Wait t gm P pyl cgh ol gm Sod m l uryl ulfate gm Wat r 72 0 gm

B JAMIN G LIDMAN M D

Strumi M. M. Ch. rnock F. W. Bl. k. A. D. d. k. rr. W. G. Th. U. I. a. Mod. field. Gl. bn. I. m. Hum. Erythrocyt. a. Pl. ma. S. bt. t. P. elimin. ry. Repo. t. Im. J. W. S. o. d. in. G. 100 at 16.

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Yung L E and Krihr D H H m lyti Tran lu i n Re cti n D et Rh in ompati bil tv J i W A out 767

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ot d mo str ble by 1 to test. The cas speted n the epot po that e st its, as tain d nearly bt and te y as t p tiel fter the last mm zation b p g a y

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The authors st t th the olysafe plan frth pront nof tagr phm lyter in ithat fgit olyken gait bl dto all Rhe give did all The pole fthe St g M mo al Hoptal ad the R ch tr Viu cpal H ptal b th f R chet hew k a ege med the

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### RETICULOENDOTHELIAL SYSTEM

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stikd ma Ihmphi the fined mn fpattmbald bet hht tpo blt it h pesetn fmt The ghouth it, rat of gbo bomt m them the life stilpd rama Of the e 6d and the restriction.

n therest e alth d adth there there there rerport d the trive lish benefict d

phragm Tb explaned why one s m at n th d ben imps sb! t d teet the rails gem thy paths tion oprus on Moreo thad cased ug and difficulties who be made it mposs bit to obtain blood spec mens fr m the ple ic v n The ple mathet that To the ple ic v n The ple mathet that To the ple ic v n The ple mathet that To the ple ic v n The ple mathet that To the ple ic v n The ple mathet that To the ple ic v n The ple ic v

pl e The immediate fiet f the operation was rathe surp ig Atmprtyre hem glbin of bef d at on man f st d its li Th s as p obably d to the massi e tansfu o s gi e p pa atory to prun The un petd eult was adfinte tende y tow d d m nut n of the p po ti n f ell pt cyt to roud f ms ad n ppa t cr s in the numb fp | bl st n g cells ith outh moglob B th ith ete dn eent d almot mmed at ly aft the perate n a d c t nued to app ar Thr nd a half me the ft r splen ct my blood studi s ho d m ny itbout h m globin a d a r ma kabl numb Howell Jolly bod s Afte th t me pe od f ap pa ent impr em ti the app a a c of the ell ensued A bl od tudy made 1 e month ft sple ct my se m dt h afa ly hi h per ent ge f cells ith a ras nabl amount f hem gl bi

ont std thine elish d stll to be sen.
The uther bele s thit the tike the gen.
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by spice ctomy.

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Mr 75 meet MD

### SURGICAL TECHNIQUE

#### WAR SURGERY

H rrl R I War W unds The Pre ent Statu f
Th I Tr atment C ad M A J 945 52

Infection sthed at ctive problem in war wounds. The first important co tribution to wound treat ment made ht een the two World Wars was the entrol infect on due to hemolytic streptococci. Since the organisms were see dary in adeas whe halw ya came from the nose in ditroit either during the most office of the problem of

t oduction of ulf smid s Th th rd contrib t was Trueta's closed plaster t chanque which ppi ed W ett Orrs m th dof treating o te mye it to the treatment of w r fract re Th tech ng enot nlye cluded second ry mif et on hut also enhanced the d el pme t of local d fens barners

by splint ng of the set to ues
In the set of the price of the man general the set of the man general to the

of ar wounds now are

1 Estly and ad quate debridement The wound
5 nlarged hy 1 gitud al incisions which ele e
t sion and p vide ad quate exposure All d
vil it d tissue and for gm mat al is removed
P rfect hemostas 5 is secu d

Drai ag is pro d d by s rt g vaseline st ps into the d pths of th wound 3 Fractures a c reduced by manipul t on Ste

ma pins or Kirs hner wit s are inserted if n c sary

4 Pl ster is applied—it should cover the wound
nd its d ssing c inpletely

5 Pa cillin a d sulfonamides are admin stered

With such meth ds it h s he n p ss hle to d se about 8 perc nt of the ounds with n tw. ccks of the w nding nd to h ve the great man nty f these heal by p imary on a d man h aled Sawce K mw M D

Edw d H C Re ival of E by Wound Cl su
Tw St g Operati n as Appli d in It ty
La t Lo d 1945 45 383

In Italy in the los gph ses i World War II
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a slog a More we it yu tifed by the following
facts

When a m saile enters the body not only does at proved transport for p thogene organisms p cked up as at passes through the skin and clothing but by damaging the tissues it cates an ideal home for these organisms. The bject of any surgery is to wreck this hom a d make it inhospitable. The for wards up goon does this by removal of clot and foreign bod es by exc. on of grossly contaminated and devitable designed to the properties of the state of

This the whill operative procedule may be conceived a one operation performed in two stages—a pelimin ry debridement to guird against sipwith a waiting period to determine its siccess indistructive for a big between the third and fifth days

Fr m the pooled expere ce f enior surgeons who had rved with both th Eighth and F rst Armies a set of rules was drawn up

Déhridem nt of wounds at forwar l units must he th r gh

2 Thed gon aw dmust not h distubd dut g v cuat n f om forward units to hase hosp t is unless th ind cat o s for d ng so are ah lut

As ess g nput 1 sp cton means inf cton This the rule wh ch has be nhardest to enforce cha g g so led for a clean dress ng is a atural m puble d ficult to r sast That insistence upon this rule profiled has rule by the mean though the rule profiled has rule by the mean the mean who in dthat 48 pc critical of 165 cont themso who in dthat 48 pc critical of 165 control of the g acust n we infect d with pathoge as 373 133 pc m 1 f 50 oud sturked women.

3 The first d ess g must be done under as puc c diti ns in th ope ating theater th opti mum tim heng from thr e to five days after

the mut al operation

4 The wound must he clos d at o ce if it l oks suitable bacteriological e mi ati n hei g g nored as a cr t no for cl ure 5 Th jat tmutbrta edith boptal untithe tre e m d

This last rule; from id rable imp t c 1 mall risofca fd layed sutur acu telf im h p tal cas tern It ly t h p tal im western Italy afte the b ttl of the C th L ne the c as a h ch

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TABLE 1 -PERCENTAGE OF HEALING IN APPROXIMATELY 18 000 WOUNDS

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El P	3 005	( 2,	( S.B.	( <sup>6</sup> )	3	(6857)	1 <sup>6</sup>	( o-

re of d layed ture n comp un ! fr ct res sec ndary uture bing fr q ently ttempted hen d layed ut e has failed A successful del ved suture loks its best fe dy afte the stitches are m ed As the weeks pas the scars p t cularly of thel groud eg trradate scars of the but tock often dev lop a go d deal of k lo d f rmat n d become red and unsightly. Often the epith lumg e as pecally at the ct facars r over th fibrou t ck | lting i om th p ssage i the m ssile Such scars are very troublesome th y may alm stiden tely delay pate t retur to hs nt neat gry \ S m of the a no b g subject d to fu ther exc s on of the sear t s ue ith immediate repar The relati n betwee the a at m cal s tuation a d heal g vas nvestig t I by n f tooo as c t ve c s s it as noted that no d of th b ttock w re the most 1 tra tabl

Und ideal conditions these ris it coold be very greatly improve that deal conditions never occur in war. If they did the would be no problem in the treatment if was counted a tip my suture could be used a two stag operat in wild rarely be coded it if it against it in mittonic craft do by war that it is consistent with the consistent of the consistent o

be cl da f lessly fo then ed is g eater s psis stabl hed n b u ually comes to stay The sta d d treatm nt of w nds f both fil nd b e (f c a d h ad cept d) th Ital n

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CHAR S B VI D

Bown J J V W daof th S ft TI u Tw St g T earment L I I d 9g 3g 588 Penculin as a local bacte static has o v I tonzed the d 1 yed c sur of soft tasus ou ds that the tw st g meth d b sh come fi mby estab lish d as th b t form of therapy Of 7g 2 wound sutured with the use f p n c lin po d r p pu clim inst liato only 6g 86 perc et b h we b en con ider d fa lu Success d pe ds first d fore star c how er iffect e mu the all wed to replace thoough wound exis or The s lts of the twost ge treatment re at r hute to the w k of the suceou in the forwad at s Cu & B & Sew M D

Cne JM EalyandLt T tmnt fGn 1 t W und of th Jaw in Fnch B ttj Caualtls in N rth Africa and Italy JO1 S 1 945 3

The t atm nt fgun hot ounds fthe; wsm y be div d d to three d ti ct pe od the first o ealyph se fbl dl sh ch pai a pby and m ntald p as n th seed do of the cruet phase whe imm bl to of th bo ir ments and c ntrol of inliet n are of pr m y imp ta

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Ayl er S O d Al p A F S rg ry a d A th si f Abdomin 1 W W u d B i M J 945 547

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c ry a m derate d gree of shock a consid cd pr ent I such pat its an iduct dos ffrm o 1 to 0 25 gm of pe tothal w sadequate

R spirat ry depr ion occurred those patients w th spin I shock who receiv d mo e than o gm fo an i duct n do e

H ccups occurred n cases th t equired large do of p ntothal

Whe po tope t e s dation as need d mor phi e was admi ist ed i ta eno ly in /6 g do es as it w s found that with established hock of any seve ity ther was v y slow bsorption form any other r te

Postoperative complications were fin and in el ded i case of v m tig case of pulmo ary ate lectasis nd 3 cas f pneum ia Of deaths in th series of 200 consecutive battle casu lt es in nb ch the abdomen as e plored in 56 cases

could b attribut d to the esthesi

With this form f anesth a no g eat improve ment in the ultim t recove; at f perforat g w u ds of the abdomen c uld be h med but at I ast the mo tal ty was no greater to n th other f ms

The perative p cedure a d p t perati d scussed in d tal It is the on of th a th s that pentotb I has been fou d to b an ideal th t f r abdominal urgery in shocked pa While this drug can be used ith af ty wbnth solyamilddgee f hock and wh ha e to be given t s d fficult to c tr l la ge do d ca t b r commended in tb cases

MARY KARP M D

Co ke W T P n y A L P Th mas G Elk
J J nd Oth rs Cl tridi llnfections in Wa W nd La 1 L d 945 48 487

Clostrd I nf ct on of o nds n buman subjects t lly w t me p oblem The l cal spread of the nf to sp c ss can be ad q ately studied
by f f l t a l ble for cont olled e peru
me tal ko l trid linf et on but the nature ad t l gy f th syst m re ction can b gat d by e am t n of th effects f pot nt t ins deo I tio with cl c lobsers tons

Fr m series f 68 wound d men f om the W ste Fontagr up f 76 cas s with sy t mer ctons haeb n studed All b t s of this g p

h d ide c of clost dal c g m n their would The g ph sheen s bd ded n the ha ver ty f the system c act o nt f ur cte s f nere s g s v ty th last c f tal es Th fatal ses 7 f the se ere and 8 i th moderate group gay a h stopatholog c l

petu of cltdlm ostus

Poss bl sig ficant f t res th both mcl fidigs w lo blod histel dhghume cr ti el els Ac d's d'dnot appear t be greater th g pth oth wou d d men While th hm tl calt desb lede f h moly nsmcs scehmly wat Floc It nof chyl m r so

curr d in a number of cases but this is not spec fic f r clost dial i fectio nor can it be attributed to the d cct ct on of clostridial to ins

At aut psy n the fatal c ses extensive fat embo hism of the lungs a dother organs ; as demonstrated and demyelinat n was f und in the central nervous

It a clear that the systemic eaction in the re p rted s les of 76 cases cann t be attrib ted to the effect felo t dial tox s Thes ere h wever al m st certamiv a mai r fact r n the 2 fatal cases a d it se ms poss hie th t th y played som part i the system reactio s in the 7 seve cases and 18 mod

at cas s a which the hist pathol g cal p ct e as one of clost dial myositi. In the remain g cases it's me likely that the part played by the clos trid a in the p od ction of the sy t m c act on v as eglighle The blanc f v dence suggests th t the pr ducts of t ssue br akdown m yb more m porta t factor in the systemic reaction than circulate

íg to m

Such co cept of the natu c ftle systemic re et on closterd lanf et ons o ld lend's poort t the ve that adequate surgical removal of necr tic musclef m th wou d them t vital me sure in t eatment of the system c reaction The lack of dra matic ffect with antit i \ ld be pected f breakdown p d cts a la gely spensible for the systemic reaction but antitoxi gi n a ly and la ge d ses m ght have ome n otect v ff ct since t p t ts the b cakdown of tissues by clostr d al toxins a vitro. It is clarly imp sibl t att mpt any assessment of the value f ch m therapy i these conditions from this small group if cases but t m p obable that it efficacy ill b 1 mited in the ab ce of d ou te surgery

JOSEPH K NARAT M D

Boland F k Cl ib n T S and Pa Ler F P Trench Fo t S g y 945 7 564

The a thors person an analy is of the observa tons n 1 5 cas s of t ch foot submitted to their cae d mg th Italian c mpag Among these cae ee 2 f mmers n i t the clinical cours of wb ch could not be distaguished from that of tre ch foot

The p edist s g factors are those of continuous e poue tow t nd cold sually with a depend nt po ition of the f et and c culat ry stas W t socks d p evious att cks of f ostb te were also cons d e ed to be et I g cal fa tors

P nful and swoll n feet we e usually the earl t sympt ms th swelling oft n appe ring before the Numbre and bu ning w oth ymptoms

and we ting and c I iness appea ed late In 5 per cent of Il th p tients the pulsation in the dorsal pedal and the poter o tib al arteries was absent Sk nb ops est kenf om pati nts without ga grene but w th persistent symptoms revealed an increased

mat on of c llagen Th s was most m rk d in the pap Il ry l yer f the d rmis and in th sm ll hlo d'y els

Fr m obs reat n fth group I pat nt tap pers that this a condt neu d pim rih h sch mad e to cap ll ry c nst cts n result gf m longe pos r t c ld Th a tio r t n fi db wet stas and pess e Th e t n ed i chem prod es ryngdg esofcapilla yd mg h h m nilet d by cd m a d c a d heat po th esumpt on olatic lat n in e ta caes which dem pers t chr eifimmt n ith diffu terminal fib os f d nd n m

cases nonp gres e dry g gr e dev l ps Simple contrast t atm t d d n the pt tt wilk atthe elestip bl tm mt go th best es it Amputat a I the g gr s pat was not n cessary a s f thes caes Ir t n is p ob bly not posbl mall cas b ted cation f the di d is ld in foot ca a d th povi on floose dra footg huld m m th

ccu ence of th e dil n B Jam Goldm MD

Bently F H and Thomson S Cont 1 finlec tinin R ent W und B 1 1 J 945 47 In an avest gat o of 1 coo b ttl nd th

gan m of ntal ps s fou dt be th staphyl cocc spyogene au s The teptoc cu pyog es (hem lytest epto ccus) was rlyf nd The incidence fiftee n and bef pa tion at the cas alty cle ri g tat on w s about 5

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h w it lift the u d in the b st po ble n
d tion f dealing with the inf to the t ma ed S llan lamid pphed l cally p d ced a b ct t tie flet f alth h the fcet gb et apr

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that holdbe d ddu gtastfmth cas ltyd stant the bhptlthn nd th thad the d tu bed

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In es A nd Ettis V H B til Ca iti Teat edwith Pn illn L ILd 945 45 54 The last xp sg ed n the te tm t the pe sell f soo e ly onded m

500 e ly o nded m a sultes) e r (sletdfm 556 a yd S rlm lad g ympt m dagn w oid

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Ai & mbol m D ring Blood Tra 1 i

L IL d 94> 48 53 The these pt cas fftala mblum

d n g blood tr sf s Th pe at frer mt f thef d f th t m handl w ph guhdb pgritwd qrtr hurs dihpt tendt a lli Th blood trasfir t gby vofth lft aph nus th kl had I ed peosd bly d as a ele at d by m I a H gg s vrng t ner th a p u zbo th pa

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# OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

CI k A M Milln G R d T dd J P FI a tin f Skil Grafts w th Ilumn Pl m nd Th mbln La I L d 945 48 408 A method of h ton f k g aft th h ma

plasma a d thromh n is d crb. I tis smlp epl t that publ shed by Sao om 1934 but different through the perfect that publ shed by Sao om 1934 but different through the perfect through through the perfect thr

foe ia efg t tlee led

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SH # 94

ST HEN A ZIEWAN M D e F M licp in in th Abdom n A

Hpigvenit bdm llytpentb stctgadh on huldblmitdt this p tents who has hid o more piton f obstruct on epeated atta ks foll g bd mn l

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F ntz V K N w M thod f Hem t i 5 g

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I EN I M O E M D

Dingianni V Ea ly nd L t Post perati Am hul t n A C mparati Study f 303 Ca Ar h S g 945 5

I a tudy of 3 3 p tint the a tho p ldst tad tg fe ly ambul t

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ver I pat t Ith n feas p to the pt ts er ded tag ps () pt nt ha g P- pendectomy o ly (2) patient have g a su g cal oper t n the lover port on of the abdome with or with ut ppendectomy or with or with ut v ginal repar and (3) patients ha g a cholecystectomy
Th age d tributions 1 th 3 group and number fp ti t n each age decade e sim lar

c clu on the author notes that early ambula ot a crease the fr quency of compl ca danger the p tent s has been prov d by cas r po ts and e pen ce Il ever ne ther d'es e ly amh lation el minat all of the complica has b claim d by m ny advocates of the meth d f po toperative t eatm t

Davis H H and Hansen T M In tigation f th Cue and Peention f Gas Pain f llow i gAbd minal Op ration S g y 945 7 49

HERE F TH TOW MD

P st per ti ly after abdom nal u gery there is defin t dec ease in intestinal m tlt; D gs such p tes phy ost gm and p ost gmine h h stim l t the mall intest n have a poosit fl t o the c f P tressin inhib ts small bo el acti its but tim I t the colon. The acc mulated g s n the nt ties cased by the wallowing of a esp cially duri g the induction phase fan the Th rutho rath r than any put efact proce masu dth amount of swill day d ng th id ct n pha e of anesthe d fo nd it to

f m 600 to 2 50 cc Sw ll w d a r and the attendant d sc mfort of gas pains can b pr v nted by the pre pe at ntro d t n f a L v n t be attached to W g t n uct on O c th a pass s nt the sm ll i latt rm the disn l g eff t

As a s It f th pep t s et on technique th p re ntage f pat taw thg s has droppe 11 om 81 to a pr nt a d the g mber f day th gas pains d spedf m 4 t 95 per c nt F the th neces tof th fp stgm was m kedly reduced also that of mm nd ctal tubes BINYGPS r MD

Pimit DB Th M hnlm dMnø m nt f S gleaf Shock J A W 1 945 7 00

S g cal sh k s the t in comm nly used to de n t th c te embarras ment failu of tl c u wh hares sa It f bodly my ry wheth rp d ced it nti nally comb t nd in s g cal pe tons o te t n llv c d nt 111

Th h shee a geat d lofd bate ab t th me ham I pod ton f hock ad ah t th r lat c le of 10us f t rs which may help b g g it b t b t i c t ras it h s be n
tablish d primily by ge th t th
wh im gly mport nt a se f su g cal sh k n

m n g od g neral c itin pror to j ry o t the call of whel blood or pl sma fb the m the culat which ed th ir ulat ry blood of me If the reduct n is ffi

ce tly pronounced a d p longed the blo d pres sure d ops to a low 1 1 a over develops the tis ues a e damaged a d body funct on is impa red on the hole and a cont n ation of such a stat r ults in c mplete failure of the creul ton and death

The loss of whol blood is by f r of the gratest mport ce since it is the main cause of shock in op ations a d in most inju ies i hich op n th blood vessels The 1 5 may be to the outside 1 t the b dy cavities rint the ti us Plasma may be lost both to the o ts de and 1 to the t ssues in b rn t the t sues only after the p olon ed se f the

tou quet and t th pe toneal ca tv as in c s f strangulati n of 1 p of intest e b an adh i e b dorm cas imesent cthrombosis Bl danl plasma : varied p op it ons m be l st into trau mate ed tissue as in himl ha in red for the produc to of experin tal shock or limbs crushed and comp ed by falling hijets a air ranicasu lities r n accidents few II fe

The e is a mount g t de of clinical evidence th t th ov rih lm gly important cause of h ck pr duced by oper to and by 1 jury is the local loss of flu d f om the circulation and that tor f med in th d maged t s s and the activity of the nervous system are factor of nly mino importa ce

The rrefutable ev dence in support of this view is f m h d by th al st complete contr ! rel m a tion of shock s compl at on of one tons and 1 juries wh in prompt ca e is rendered in bo pitals in which the ope at techniq ease cellent and bl d nd pla mat of on a g en in mounts equiv

ft r the blood a d plasma loss

A full apprec at f these facts will le n the fear of ry sa dt 1 facto s and lead t a great e in the f q y of transfus ns g n in am nts equivalent to the blood a d pl m loss a th correspond g imp vem nt in the results of su gical therapy JENE KIRRPA K MD

M L hlin J A Th Intra no Us of N oc in a S b titui f Morphin in Po t perati G C d M A J 945 5 383

No cam h s be a im nustered int aven u ly in the te tment I t n tu u tum and for th p ur tu f jaundice R tly proca e bas b n g n nt v nously fr th gical tr atme t of b rns It ha been show that proce e is d toxified and hyd oly ed down t p ra aminobe zoic a d a d di thyl mino-etha l vh ch are e cret d by the kid y vith n t n o twelv hou s

Pha m col g cally proca e has a ma k d affinity for erv tissue and cts as convulsa t d t mu iant of th cer brum Syst mic react o top c e e and can b p ed et d by mea of a ntra d m I whal of p oca e Tox c reacts s d ing th i tra e ous adm n st ation of th drug m v be e the of the con ul nt type in the cent al vus system wh h can b c nt olled by s d m lum or of th resp rat ry-circul tory type nt olled hy ad enal n

In th authors s ri of postope ti ca nver ag nitraenulja ub t tute to m rphn Both s ith sorog m ting ad mala i m morphin e el m ated and the D i d of r lef f om pain grath ex e d d that ob tan I th the latter drug Th am unt fooca g en was gm 500 c fn rm Isal e luto The were not e ect n

B G P SHAF MD

### ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

P ters n L W P phylazi f Wo nd infection Studi with Prt cul Rf nc t S p nd Irrig ti n 4 h S & 945 5 77

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STEPHE A ZIN UD

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AZ M MD ST P

Spi k W W and Hall W H Penicillin Th rapy t th U I rsity f Minnes ta H pitals from 1942 to 1944 4 I t M 945

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WITER HIN U NID

#### ANESTHESIA

Rmnleg DA nd Adrı n J P longed Son I An th ! S g y 945 7 514

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The property of the third that the transfer that the third that the t l ltn Lachel to

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ater The resulting lume of lutin vin hen th ma mum do g semplor i sr lati ely mall Th mit injeted atothe suba cha d p ce through a 20- r 2 g uge needle a p dly a g ntle pressure n the pl ger perm ts ith t b rb tage Th late alp po itio is pefr d b t the upright s tting po ture may be emply d if de ed The spnlpnet sifrm dat th l el f th thi d l mb nter pace for c thes a b the costal m g nan i t the level f th fourth Imbr nt rsp ce wh n le s vten i c anesthe eq ed Imm d tely foll 1 g th inject p tie t is placed in h lack and the per tig t bl 1 tlt din a T d lenbu g position The an

gle s ith th h ght of anesthe i des d The had 1 flx da sh ply a p 1 lc up n the th by s pporting t upon d tl I pillo s that th may not c dit the ce ial reg n Gnrilly ith n bifteen t ntv seco d the s b t notices a fel g f numb ess the lo er ex trem tes

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does not s kth a a f complter s bltv b t ted the fhyp lg I mini h d The le f dema t ntt nth hypalges a d un nesthetized ally sh p d ell d fined When th In of dem to tio lie in th d matom in h ha sth ia is desir d th a t fth dgstrm tdbyp mptly adjst g th peating this the histipoitio The hypige c re i lue time become mplitly

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pston are significant and the pston are significant to the clear t dgr of cl tn f the 1 rat g t ble F pp abd m 1 geyth i e en th cc gm ts m t be eth t d a d to s c e this t tofa sthe th n l thon must be t p pp mat 1 dg s Filur t bt in sat f to ya the fr pp abd m ls g y is f q ntly d t dly cling th tabl p mptly Whe esthes bl th c t lm rg oughta a gle of f m t 5 l g u ally ff nt T obt 1 th

fth pen m tem t th | t g tall h uld be t lt d m gl f ip imat l d g ee c d F lur t tilt th t ll m d t ly at ffmst mmed thy aft the jet may ult a the nd mil tem scula l t ult a th dos g linl glinl i the trity lit t thesals d F i jee all lig fm at 5 mgm fn pec vld tletv

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The atthese bleve that the excellent m scale rel < tin and p clong d ope at ng time make the type of anesthese v y popular with g ms. Mary Karp MD.

Fr sa A D Blocki & fth Middl Cervical d St liste Gangli a with D scendi & I filtra i a A the ia Tc hniqu Ac id t d The apout I d cati n A ch S t out

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ne t et c The method a dis bed as a de cind g filtra ti n an th a 1 front of the pr v rtebral apo eu ross with p ce t pocan With the patint i th sitt po to the tra sy is process of the exth recal pos ad nt fi d and the dia tod cedalm tprp deal lyt theb e iths structur at the p 1 t wh r the m ddle cervical g n el n l t F e cub c c t meters f the solu ton inj t d ga st th bon nd beh d th anoneu o  $\Gamma_{\rm h}$ dl 1 th n withdr w 20 mm to b o tof the r st tant p ev tebral pohich p st nlom s to occ of the n ross

the cost l mag n f om 7 t rom m mpl for surgery of the extremt es from 25 to 5 mgm are suffice nt In the upp age groups the love l m t of dos r uges hould b mploy d T nor fifte n mutes should b allowed to clapse ft the n ut no f the s lut n befoe chag s; post ease attempted T radele burg pron 1 th t n m and

th postons may then be employed the steps. Anesthesia induced by the tching was employed in 800 concent suggalp educes of 11 types I 9 sper int fit cases the anthix tended too by not be fifth three cases the anthix tended too by not be fifth three cases the set table held tenth to lith and ninth three cases at table held tenth to lith and ninth three cases at table held tenth to lith the and in 11 the tenth of the tweet on since do the lumber and a call genets Stateory, and she as blamed in 11 but so ubjet In the effeture suche ours to foton lumbar pinter. Dit to nor the anthree the state of the

gain dwas that hyp tens on a no moe o pe alent the supercame than in pula this with the drugs Vs preso drugs we edlet restorates ne ery instance. The mer is of all all anesthetic drugs fr sps al

anesth is must be based up n potency systems to tone than did altour; Nuge came is them to cand more pt t than prease and souther agents. Potency and toxics to do not necee anly na allel checker. The amount funge can quid for hamedage eed and his yild by pocane is naide abily 1s. The ele althout he prease psesses gaset bolute toxis its relative toxic ty approximates that of pocane is not provided to the prease psesses to provided to the prease psesses and the provided to pocane.

M the R G Livingst ne H and Willim n V C ntinuou Spinal An this is Observation in 1 200 Patient 4 h S g 945 5 3

Twelve hundred pat ents wer p ated pon und re nt nousp I in sthe in The impress o gan d f om the line all p rence were eport d I re an hyd och! de sthea esth use gnt d n the ent e ies No d II ne in effet is between the procan cristals a d ther pre et lutton was not d The magement fa o t no ou p nal an sthe a wa d se ibed in d ta! Pr lumnary m detton was compted of calcum

p nt barbit l and m phase donitral om to on and neh lifh urs befrope atin though discussin a mad of the tchang the p nal tap and the otn spall set p Tb undely ng princpl f p nala eth a we eca fully observed thog hot the pode

A complete study in lud g postope t ob r vat ons was m d on th fi t 563 c n ecut

This type of ne the pdcd cell at muscula relaxatin Aft ugery drigth fit tet twenty hursth pt into feered n bett codt on thin thy w fter

solution are i ject d. The solution blocks the mid dl inf for and stell te ganghon by its d see t in front of the apon urosis d diffu donadın the s ft cellular to ue If th s fails to p od ce a Horn r synd ome a sec nds mil jectionism de d ected to the hase of th se enth c rucal trans

The various therapeuti a ddiagn te d cations for the procedu are described. The various phases of the tudy ar given n conside able detail An rEN VER MIGGH

R J and Fish AJ Clini 10be vati n n the Use f Cu e in Ane th I Ane the 1 gy 945 6 24

Crarch n t eplaced the orders method of p du ng r la ton fo r ut ntra abdomi l surg cal proc dure Howe e it h s b en u d con servati ely as method of improv g rela t n It shows pect I d tag wh a comb ned a th evelo propage as very little circul t ry dep es r r sults vn in porn L patient Feve compl t as occur when small did didoses of the drug a e ed and to t talo t ty lm t d to b t n co and

g mgm I the plese coffdeep ether he the a twa n ted th't even mill do es of curare cau e eve e ci cul tory reactions Therefor it s nec 3 to e cie con drable caut n h n ar and thr

ae ed tog th r

When suffic at our s zi ca t p ly c the m cle of the larynx asp tio of foreign m te i l int the lungs may co le s d t te pr cautions s ch the us f the nd tach altub ar tak n I alo ed paralys softh muscl s ir sp t nand m scul r spasms f eq ently occur w th la g d s f cura e Tham y le d to hapo a t th accum latin f tenacius m cu in th m th dl yn An Igesia was t obtain d with cura e alon Ho ve larg d se would p d ce compl t elax at on f the skltlm cles ad con counss A detal d report fse e lesses w mad in wheh nalge ia w s tt mpted by me n of th nt a n ous dmnst tion f curar M cular to thing a d sp sms were observed d g th r per od follow ng larg dose

The tod t nof the drg nt an sth s l gy consided a step fri rd n the pc lty b t f rth tudy; nece any to claly tin th s pe of elless dth lmt tions Ith: drug MAR K RP M D

Martin S J and Schw b J M Blast Inj ri nd Th i An theti M n gem nt A th 1 gy 945 6 3

Th ubj ct f blast jr s is id r i mp t nt and tim lyf th c lana estheti t as w lla th in th m d forc ln; i t the body r s it g fr m d t nat n f h gh xplos i ges in b mb depth chags nd t pd a k n blst jues An tenseriw prentdof th acad mic nd t fabl t dhida

lic concus i n injures of the linical evaluation f th ir symptomat logy and f a propos d anesth tic manag ment of such ca es unde go ng operation

Follo g a blast the sudd n relea e f p ess e c mpresses the immed at ly surround g air to form the p essure component vh ch may have a p e s re as high as 200 atm spheres behind this th re develops a second ry compens t ry wave of rar fac t nor thes ction compo t which my att na p essure as high 5 lb per quare incl

The mecha sm of bl st m; is most wid ly ac cepted pr po es that the l sions follo the traum t c ff ct of th hlast wave upon th ch st The pressur w e f the bl st p duces a sudden elevation of th atmosphe c presu e hich b th hinde s e p l n I the air th o gh th t ach a and forc bly compress es the thoracic cage nd the bdome

the pulmona v stru tures ar ruptur d and hem hage occurs from the su ro ndi g to n essels

E pe mental a th on animals has shown th t Fatal effects of p m ry bla t ccur o ly in an mal latively near to the explosion Tall of the blood p essure occ rs p po ton t ly to the intensity of the pres u e wave the initial fall b g the result of traumat c shock whi th susta ed f lis the result fant ceases that pulmonary bl dre ure Immed ate death is due t shoel inte nal iniu v and occl s n of the a ays by blood clot Del yed d ath s a sed by p lmon ry dema lly by int peritoneal hem hage I d occas Ruptu e of the ear drum oft n cc a d bdom nol lesions are found in about 4 pe cent of the cases

The symptoms mot comm ly e peri need are sh ck e tle sness dyspn a chest and abdom nal pa c gh exp ct ato h mopties and l g nd t nk tend rness P Imonary bleed g cont n es for f rty e glt h urs nd unl s compleatio a Le smptoms s lly ubsid ft ten days Th most f equently noted \$1 mptoms eferable to the central n v ) tem a temporary uncon cousness a d later 1 tense h ad che d ess and letha gr S dden death is due to byd tatie h nges the ce ebral c reulat on econd v to sudde compr ssi n f the thorac c cage The claracte istic path long co sists of h lateral p lmo ry h morrhages Mic

copically gest n of the alleola capillrs as most frq ntly i d Th imm d te prog os s depends up n th t nt of the inj ies lifthe cen t al nervo s system ext ns ely v lved death is ually mmediat Death may b due to shock phyxa ltrt econdary invas on fd vital

ed lung ts e

Theus I bomb shelte wl neve p ssible h avy I thing a d cott or plast c ea appliances a e p phylictemeas In the penc fanimp nd ing hi ton should e hale fo cibly an l attempt to prot ct the m t vul erable pa ts of the body such s the ch t ad bd men

Imm do te therapeutics : clude the t atm t of sh ck and hypox by pl sma or wh le hl od and o ygen Aden t morphin heat and the T end I e h g po to ar ec mm d d wh dyspn a ntp ct S gervi perm bl nl hn r

g oth pd cat d Another type f bl st nj ry that pr l c l by ыīт m chaimi mart that p d celi but the noth love not fib moth acl th and stand t act and lungs and met me ne f ation f the bo el The sign of hyd a h abdom nal ne in lud sh k lehedrat in I na n mel na hematem is chest nam h m ntys s dispnea pyre ia a d perh no eva s Unless the ig. f nacut abdom n lc ndt a i d putable perat a should be a thb id a nearly all of the n tents ec ver without perati n a d

that the planesth and operation erapoorly When anesthes specsary ts mp that to ha ean wither state one es a the ough kno I edg fth bacp cpl and hors ellacquit
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rati nt Reonal neth sis n e of its may fo ms hould be emplyed if posibl n p ef ence t general n sth is Its ad t ges ar its m mm l int if nenth repat y and cado ascul r systems Treem nain e bl k hach lplex s block a d t reo tal o p ra e t bral b) as a e u ed th very lttl compleat n Sp lane thes a tor r s belo th t elith th rac segm nt may haf fon tons on the lo t m t shock nd can b u l ans

perati n bel the dai hagm hn ho & s n t pronta dthee noothe cutt dcat n Fridu I bl k not con. I red p pul Hh n al a sthes a dicated a clo ed sy t m th end trache | cy | r ra e meth | reg rded

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th b t S lu s nt th lint n tt mallty mall hom c my te tan sth tit

It fiml bl libt liv or nh siol er and bath | gr fbla ting ryeanth mi f v re lan a e thet st Dr s les f and at f t an sthetcm n geme t

### SURGICAL INSTRUMENTS AND ADDARAGE.

Rhin land FW and R pe MW Adj tabl S . 044 The value from teplatte is fribe e t nande rrect on fideform t s 1 td ea

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The mp tranc fd h r f th 7 nts ath ut ght be g ann t b too st ! st sed Adjust bl a t e bibt the chef } fokead b btthya alous il c a nally at oth st

C Ro ms M D E

## PHYSICOCHEMICAL METHODS IN SURGERY

### ROENTGENOLOGY

So 1 A B G s S W nd Irving J G My
1 g aphy by the U e i P nt p q in the D ag
n is 1 II ni ti ns ol the Int rv t bral D sc Im J R Ig 945 53 3 9

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gn body Th pe t tel d l with the authors experi s s of z o myel granhic e ami at ons perf med t the Hall ran Ge eral II p tal State Il d New York which nop gemd m p nt paque was us d Sev ty sev patient in this g out e p t d p so that an objective co fi mat f th I nical a I roe tg find gs

as poss bl The tech q of th lumb a dc c lmv l g phv is d bed i detail I s ve al photo phy is d

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A a aly of the result ho s that th a th pos t fi di gs the my lograms e e t roreted ll b t t d on ca h m ted cin maadg 1 ds nd th other a hern ted 1 thought to be a pinal-co d tum r In 64 of th 77 p tients the site fth 1 e lag daccu th chofth ddit alsc s s th m 1 rhe at

ide t fied b t sl ght acces y d f ets ote l th myelg m tfou dat pe tio I the 5 tem i g cas fi p ts of t rp etat

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d ff tiat b t ce lous type f dfcts ch bl k gap el h glass lat ral d oot types of d f cts Th y us ou rontg gam t ill t te th grufica ce f the if ct Th val cl dee mpl sol m lt d fre rr thernato add cuss sep tly the hemiat is fice call to the tral d cs

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pect dad withd not hease t moes up and d n the canal m re rap dly tha lipiodol h n r po led it flows t geth r more c mpl t ly than I p odol it nters readily at sheaths of the nerv ts it is ontoxic and rritating when I ft in th spolca lad tis abso bed f m th ubarach n dispace tith rt fab utiee peryea In 4 Drc t f the authors series f ca es all f the nantopaque as mo dat the e mpleti n of th my lographic examination in 45 prc t f th ca es os pront me as rem ved n 2 per ent from 30 to 95 per cent was remove ! nd in p c nt e a emo d \ lleff ct erved in my of th css

The co clust sreached that pa t pag my log phy h ld p c de explo ation in nearly every case for the folio ng reas s ( ) t fi rs bj ct v v de c a t 1b p s c fales on alth ugh the

gativ findings should be co s d r d th som caution (2) it I cal z 5 th s te o sites f les o (3) the p c d simple safe a d pa l (4) if p top q is left behind t s n toxic o irr tat g and absorbs sl ly d(5) while the prt n f r rem al f herniated disc not formidabl po t my lography h ln t st bl sh m p c s

p at v in leat Pant paq e my l graphy occup much the am place in the d gnoss of p all so that p umen cephal g phy ccup n the study of cerebral

T Lrecum M D d dis

R t 4 Th Impotant of Examin tin of th Sputum in E al ating Parenchym I Infilt tin A J R 12 945 53 37

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ar peent d hich had oentgin changes mulat g pulm na i t bercul an i f tg n h ge th e class fid mnmls mode thy d need n l far ad anc d to alm ot thuth it m Th oe tg find g d rs a d ng dfom m m m l to te \ l g change Only 1 caew ympt mat c h l ll th oth rs h d \mpt m d rs ad ng df om m n Il th oth rs h d vmpt m th t and ir m m \ d dyspn nd f tigue t ecepdet gh s bf br l tempe t e los fw ght I hm ptys llo e er o f them er had putum p it f tube cl bac ll

Subs q t m at reld that 4 patents h d pr m v car ma 1 the 1 g 2 h d Boeck had c ma of the m tast n m s h d cord tub lous b nchecta hl the thers h d I mph tie le ma with lung change l uc m

Il Igkn l mtr l t nos an li flei ev f th lng nl Ave za ı ` pect el

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lou I ng ondit o s may e en produce el meal sy mp ry cls ly if not v ctfy the toms th t simulat

symptom prod c d bv t be cul

The abs I ted gn st cfe t re the d monstr tion of the tube cl ba llu in the putum When a pati nt pecto ate putum f om befo th bifu ca tion of the t achea th sputum c nta ns t h rele b cili fan open i son of t b reulo is x is If the ptmha al aysb n neg t earch sh uld be mad fo nont bercul u p lm n r3 c nd tion ev n if ther ntgen cha ges s be st tuh cufosis

The ro ntg nologi ts d agnosis f the chest cent g a gram for tub reulosis sh uld be pr s mptt e rathe than absolute unless the charcal dat ev I that the p turn 1 p s t e fo tube cle baculh

Adenoca c noma of the lung el ti elvsf werow ng and n the early t ges may n oduce er. I ht pulmo ary sympt ms it may as fy be mist ken for n ct e r m ldly act pulmonary tub culos s The p e ence f a par nchymal less n in ind dual in the fifth o sixth decad ho ha e p rsist ntly negative sput me min tons shuld I ad to th investigati n f ca cinoma the gland l r f rm of which is appar ntly resp ast e to e tly rad caf JOS PE K NAR.

B br n C F Som Roents n logical Con idera ton P t ning t Uppe Extremity Pain J 4m M As 945 7 888

P in d ablty a d ab ormal s mats n in the upp ret mity m y b duet trauma (co t on spr in fr ctur dislocation) or ac t infect o the mat c fe e or b rs ts C l incation in th reg on of the sup alp n tus tend n may cause un usually seve e par and d abil ty

Patients with negat c should r roentgeno ams are an e gma t the phy can In such stance path I gy n the r gio of the cerv cal p ne sh uld always b con id r da del minat dasa diffe ent al p shirty A common finds g s thin g of the ters t bral d ses and d g erative hype t oph c arthrite h no in the ve tebra. This s fr q e tly

tlook d n co s den g the ca s of sho ld p I'a n is caused by pressure on the nerve root eg n of the interve tebral foramen. Arth it c hang son the nten r body of the erieb a do not p duce par

The b st th py for sho ld r pan is the conv n t onal mas g m nual tractin a d ma p latin Dathermy tend t a vate the cond tion R e t gen th rapy ba p od ced etc l' at re ults m burst The reli f of symptoms s actually d t the t s actio fth xry nth if mmat nandn t n th calc um. The results of ur dat on therapy of patients with ruc l ribrits hav be n f in those ast nees in which a surround n inflamm ton was pes t The rd tin fedema a d pas sive o g str n in the i t rvert bral foram red ces pressu e n the ners o ts nd the by re In hype tens ve pat ats d p m duces the pa the blood pre ure is f quently seen th s can d by grad tion f th ca ot d ga gl n

The author us s fr m 75 to 100 ntg s/20 k p osmm of e ppe plu 3 mm falumin 6 cm distance) twice we kly at first the name weekly friom stt eight teatments 4 sm ! course of th rapy ; repeated in from six t git we Ls Caut on should be ob erved not t und teato or rireat this pate to If a le ion is radio. res stant then x ray therapy sho ld be di cont rued Irradiati therapy has als been efficac ous n the tratm tofherpeszoster Markice D S cs M D

K s ba h H H and Do lan G P Roe to th apy f H m ngl m f th L rynr in I fants J P d at t L 945 6 374

Hem n 1 ma of the lary nx in infants is a v ry re co iti n

The authors epot 2 cases n which rentz a therapy produced very sat sfactory re ults. The f ats were three mo the and five and one half mo th old r pect ely In b th em gency t acheot my had t be perform d p or t th 1 t tution fan t atme t A tum rd f I 200 ntgen R c nl ss than thre we ks with 200 ky p ved do at Th a thorsal coll ted o cas form the it at te Th a tabula lyp s nted by ons d nne the m st important f ctors such a s x of the pa tent ag o tstand ng symptoms em ons lo

tion of th tumor method of dag os t atment e d result and a crated path logical and tons The following facts ar established

Hema g ma fthelaryn n nf nts s cong t

It occurs m te mmo ly in the m I s altho gh th cases fth authors we infm is Th symp rde if a ency a e obstruct ve dy pr aspirators strd r hoarse cry c o py to gh blodt edm c grshemorrhae adle il c mpl c t n The e may he thee eplm a nerm perod of rems on hut chag a blod virac of thit mo Them; ty of the go Th f sons are located n th ubgitt d gnosi i ba don th hi t ry ndal ryngosc ; findig f do bl hs bglttem ss I the pre n of trdroem strul ot the po bl uch sa mall gl tucl m c ng n tal eb ca the glott's macrogloss I ryn al pap ll ma ь 1 e st e lag d thym m dasti l t mor no fo ga h dy It omplicated by fev per lary geal ab ces ud cute nie ton mut lob elmmtd

The teatment consists of low track of my tor It we ob truct d) pn a a d rad at on th rapy 23 soon a p s ble B cau e f the impl t a d ac curacy fapplicatio the uthors comm nd cent gen th r p) with the t chinq pec fid sho e as the method is he should r d tion i! s rg cal m val pr i bly by thyr tomy must be

T L CUTT MD r ns d ed PM EAPULW dCI LEA Roe t gnTh rap of Boeck Srod Am J M St 945 99 5 3

fBck rcod the ep th l The bals lgatell of the dellth i wth cas



Fg Lit Sitthickn fith hilm hid a blat tlym p do think with soft fill ti t nit thind add all giveld (April 5 94) Right Clinng fith hil thinking difth soft picty belwithe night hilm of ly 7 94)

La ghans typ n the abs nee of cas at n lets, by there is me cent al neero s Beca se of the haracte tes the p th log ts fin nel a sily the ds ase as hyp platic on neae s tube

Cl n cally the c nd tion mo t f quently cc s in th m d a tinal lymph node d the pulm rarv tss s although p t cally every gamo vst m of th b dym y f m tast f m of m nt Oft n the nt atho acic m f stat ons tw th ut phy cals gas and withot av firth retas nof th de e In uch nt n tg nexam nat o f th che toly them tomo tant role in the dig The hada gs rul r flet the d gree of g ment fth m di t nally mph nod and the lat d nva fth pulmo ; struc lag d lymph n d s prod c ft t es Th lb lat d shad ws n th hi al ng th m diastinum ceas nally f m g br d mass v lying the hart and grat ess ! Wh th n olved the les as app ar in v r s f m s has widely dist but dica e pat hy den te rgul titon fibrou b nd nd en un f mly dst buted miliary nod 1 A ds t gu h g fe ture s th disp opo t on t m ldn s

fith clinic 1 ymptoms Bea e f this bengen
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tt mpt to bta nome af rm in n stothe prese t t t f roenig n the pv n Boeck. s c d Th iv n rephe we ee d but the an wes f i d to th wadditionall ght on the bj ct. Most of th t dol guts app chd have hd no pe n othe d s d g n t n its n ther py and only a er vie i amed to h v be reid d f

ite im m nt

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The primary conds are rand that ceth esults we favorable in the majerty fith

c es an I no unt el fict ere I th us fratgar ath tratmat fBck fidit lea gelard tear at dfnt i garln t tue ffcae The tr MD

### MISCELLANEOUS

Packard C a d E n F M Comparis n f Phy cat a d Bi l sleal M thod f D pth Dos VI su em nt R d | gy 945 44 3 7

The autho m dea mp ehen i sere Iphi i cal and b I bi ald a em a ur m t f oentg n rays of ar ou quit see r gth ntr a gea curr ntly u ed; therapy Th k a started 1932 and fin hed 91 In the present art ci the r ults f the mea u ments fo o ntge av p luc dat ppo im tely on so and o L a nubl hed

The auth rs follo the tem 1 vgs n the glo sarv IT che cal Bulletin 1 fth Rs 1 lo 15 ty of 1th Ame c The us the 1mb l D friee a do ont to D f surface deont as to (t depth fem) D for derth do e r nte ts (to pth fnem) and D i vido corint n tv Allisa rat a e pe sed as pec nta es in c f rm ts ith e tab Ish dusg the cafp nta e depth do
In add to the familiar D/D the rate of

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the pour f more than on half m lbon gg r m de

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### SURGICAL PATHOLOGY AND DIACNOSIS

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RICH DJBEN TIJ ND

### EXPERIMENTAL SURGERY

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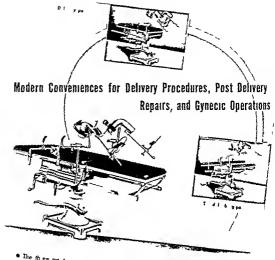
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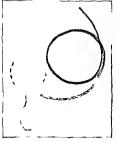
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Simplifies Difficult Endoscopic Problems of Removal of Foreign Bodies From the Stomach



Particularly in children the new Equen Stomach Magnet eliminate many abdominal operations for the removal of magnetizable force in bodies from the toruse!

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Built into the end of a duodenal tube with an in flat on attachment, the magnet is small enough (>cm lon, 0.5 cm dameter) to be pared through the mouth and e-ophagus into the tomach under fluore-come guidance without it could be expended to the contract of the could be contracted.

The stomach 1 then inflated to lift away any collap ed portion to permit free play of the ma net to attract the object for withdray al-

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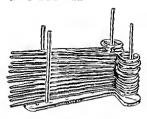
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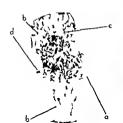
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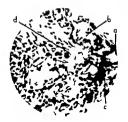
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## SURGERY

## GYNECOLOGY AND OBSTETRICS

An International Magazine, Published Monthly

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NOVEMBER 1945

IM

### OSTEOID OSTEOMA

### With Case Reports

J F HAMILTON M D FACP Memph's Tenn

STEOID osteoma is a benien bone lesion so named by Jaffe (2) in 1935 He believes it to be a definite en tity and defined it as follows The lesion is a benign osteogenic tumor of slow growth. The original phase of its evo lution in a given site seems to be the prolifer ation of the local bone forming mesenchyme and particularly of its osteoblasts. Indeed at an early stage the tumor may const t largely of a vascular mesenchymal substratum close ly packed with osteoblasts although showing also a scattering of osteoclasts He (3) made a further contribution to the subject in 1936 In a later study of this condition in 33 pa tients by Jaffe and Lichtenstein (4) they saw no reason for changing Jaffe's original con ception of the lesion

Since the available literature on this subject is small it is felt that a further discussion of the disease with a report of an additional 5 patients would be morder. Furthermore it i believed that the condition is more prevaled and widespread than the literature indicate.

As stated it was in 1935 that Jaffe described in detail for the first time thi beingn bone lesion and reported 5 cases. All of these patients had come to his attention in the year.

1933 Because of the similarity in symptoma tology physical and reentgenographic find ings and the pathologic pattern he gave the lesion the name osteoid osteoma

In this same article Jaffe refers to a paper entitled Sclerosing Osteomyelitis of Carpal Scaphoid 19 9 by Hitzrot with roentgeno grams similar to his Cases 1 and 3 but with indefinite microscopic data Again he refers to 2 case reports by Bergstrand 1030 under the heading of a peculiar and probably not hith erto described osteoblastic disease in long bones of hands and feet Jaffe feels that these were probably osteoid osteomas By 1010 Jaffe and Lichtenstein had studied material from 33 patients with osteoid osteoma klemberg (5) reported a ca e of osteoid oste oma in 1941 Five more cases were reported by him (6) in 1943 Mallory reported i case in 1941 Horwitz reported 1 case in 194 Thoma referred to the condition in 1038 and Lewis recently reported 11 cases in 1 of which there was no microscopic confirmation which we hold to be imperative before a final diag nosis is made Withour 5 cases a total of 58 pa tients with osteoid osteoma have been studied

#### ETIOTOGY

The etiology of the disease is unknown Whether trauma is a factor in precipitating the condition has not been confirmed

#### CLINICAL DATA

Age The lesion is most commonly seen in the second and third decades of life however it has been reported in both younger and older individual. Our youngest patient was 16 (Ca e 5) the oldest 40 years of age (Case 4)

Ser In the 33 patients studied by Jaffe and Lichtenstein there were males and 11 fe males In our series of 3 cases there are 4 males and 1 female

Symptomatology Pain is the dominant pre enting complaint in all patients Its intensity varies being relatively mild to intense and even preventing sleep in some patients. It may be intermittent in the early states grad ually becoming more constant until it finally forces the patient to seek medical advice. The pain has usually been present for 3 or more months when the patient is first seen by his physician The pain is most often localized to a very small area frequently not over 1 cents meter in diameter directly over the site of the pathology occasionally it i referred (Ca es I 4 and 5) The pain and tenderness may ante date any other clinical or even roentgeno graphic evidence of the di ease by several weeks or even months The fact that the pa tient has local pain with few physical findings to support it and even negative roentgeno

grams in some cases is one of the most strikin, features of the disease Physical findings Evquisite fineer point tenderness over a small area rarely more than

centimeter in diameter 1 an almo t con stant finding. This one finding should imme diately arouse su picion in an a stute observer that he may be dealing with a bone lesion of the variety osteoid osteoma. The degree to which this physical sign is noted will of course vary according to whether the lesion; in ear to or more remotely placed from the surface of the body.

Swelling of the adjacent overlying soft tissue 1 present occasionally. This is due to congestion and edema of the adjacent perios teum (Caese and 3). Local fever is very rare and redness of the skin is seldom noted. Oc casionally, the patient will complian of a hoot at the site of the lesson which is due to a deposit of sclerotic reactive new bone be neath the periosteum. This is pecually prone to occur if the lesion is in the shaft cortexofa long bone and may easily obscure the real pathology unless overexposed roent eno ram are taken at different angles to brin out the nidus as suggested by Pomeran and quoted by Jaffe and Lichtenstein Whether the pathology and the properties of the prope

Two of our patients (Cases 3 and 4) gave a history of direct trauma 7 month and 23 months respectively before admi ion to the Clinic

Skeletal sites Osteoud o teomas have beer found in the following bones namely tibn fibula femur vertebra bumerus ulna skul facial bone phalanees (manual and pedal) patella calcaneus talus tarsal navicular and ulum. The bones involved in our y cases were as follows second cervical vertebra (1) hum errus (1) tibia (1) and talus (1).

Roentgenographic findings The vray film of the affected region will almost always reveal a bone lesion responsible for the symptoms and si as presented by the patient. Occasion ally the first picture may be negative or the lesion may be so minute that it cannot be seen even after as long as 3 months from the onset of pain as in the case of 1 of our pa tients (Case ) Therefore the a e and loca tion of the lesion will determine to ome de res its roentgeno raphic characteri tics A typical picture of an osteoid osteoma (Case 3) reveal an oval to round area from a few milli meters to 1 or centimeters in its oreatest diameter the center of which presents small areas of rarefaction and condensation Sur rounding this a narrow zone of condensation and in turn ju t outside of thi i a zone of rarefaction The surrounding parent bone i as a rule sclerosed for a variable depth \ary ing degrees of this roentgeno raphic description will be noted for example (a) our Case 2 presented no bone defect in the first v ray picture but weeks later a very small nidu showed up in the external condyle of the hu meru example (b) in our Case 4 a small lesion incorporated in a ery dense thickened sclerosed tibia vas obscured by the thick sclerotic bone. This may be easily overlooked in a routine roentgenogram. In the latter

case one may have to make several overex posed films at different angles before the le soon which may not be over 3 or 4 millimeters in size can be seen.

Osteoid osteoma may occur in the cortex just beneath the periosteum (Case 1) intra cortically (Case 4) or in spongy bone (Case 2) Evidence thus far supports the theory that a much greater defensive response to the lesion is made in the form of marked thickening and condensation of the cortex subperiosteally and intramedullarly if the lesion i situated intra cortically in the shaft of a long bone than if it is located in cancellous bone. The reason for this perhaps may be due to the presence of larger stores of calcium and the factors essen tial to its regimentation being more potent in cortical bone than in spongy bone However the is purely theoretical and based on con-1 cture. We have no evidence that this be ni n bone lesion has ever invaded or broken through the periosteum but if incompletely removed surgically it will continue to grow and produce pain as it did before operation Osteoid osteoma has never been known to metastasıze

Laboratory, findings All laboratory tests in our cases including Wassermann blood counts urnalyses and bacteriologic cultures were nonrevealing as to the nature of the le sions Cultures were made in of our patients (Cases 1 and 3)

### PATHOLOGY

If the pathologic lesion is near or on the sur face of cortical bone the periosteum will likely be thickened edematous and show capillary en orgament (Ca t 1) The involved portion of the cortex will al o be hemorrhagic in ap pearance If on the other hand the nidus i within the den e shaft cortex one may find much sclerotic new bone having been laid down beneath the periosteum as well as on the medullary side of the bone. The gross appear ance of a typical osteoid osteoma usually con si ts of blood stained gritty friable cancel lus like bone The cut surface shows reddish brown flecks mixed with pearl gray osteoid Th reddish brown flecks represent the cal cified osteoid quite similar to callus and the pearl gray the osteoid

Microscopically a typical picture of an ost eoid osteoma (Case 3) consists of much vascu lar richly cellular embryonal type of osteo genetic connective tissue representing all ele ments necessary in the development of mem branous bone from the most primitive myxo matous connective tissue cell to fibrous con nective tissue cell and finally to the osteo blast in which are islands and trabeculae of osteoid calcified osteoid and atypical ossified bone surrounded by large numbers of osteo blasts and not a few osteoclasts. At most any place in the vascular cellular stroma one may see osteoblasts and an occasional osteoclast Osteoclasts if adjacent to calcifying osteoid or atypical bone usually lie in little depressions called Howship s bays

The foregoing is a description of the center of the lesion but as the periphery is approach ed there is more of the osteoid and calcified osteoid which is responsible for the sclerotic outer zone seen in the roentgenogram. Just outside of this zone and separating it from the more or less sclerotic parent bone the primitive vascular mesenchy mal type of connective tissue predominates with its ramifications evitending, into and filling the already enlarged adjacent interstices of the periocal sclerosed bone This tissue may reveal osteoblasts but no osteoid or calcified osteoid and is believed to be the precursor to the formation of the pathologic lesion.

### DIAGNOSIS

The diagnoss is relatively easily made provided the pathologic process has developed to the point where there is roentgenographic evidence to support the clinical findings and the physician 1 aware of the possibility of the presence of an ostcoid ostcoma and has been schooled in the symptomatology physical findings and roentgenographic evidence produced by the pathologic process. In summarizing the following are the unportant features which are of aid in making the diagnosis

r Pain of a dull aching character most

I am localized for the most part to a small area but which may be referred (Cases 1 4 and 5)

- 3 Tendemess directly over the site of the lesion and usually confined to a small area i or 2 centimeters in diameter
- 4 Soft tis ue swelling may or may not be present (Cases 2 and 3)
- 5 Bony tumefaction especially if the lesson is in the shaft cortex of a long bone (Case A)
- 6 Local fever and redness are very rare
  7 No noteworthy systemic symptoms have
- 8 All routine laboratory tests including culture of the lesion are negative

9 The majority of the pitients are in the econ1 or third decades of life when first seen

It one is not experienced in the symptoms and physical finding produced by the disease and especially the roentgenographic features he may easily overlook the lesson. Fit thermore he will be prone to misinterpret it as one of an inflammatory nature. This has been a common error committed by those un acquainted with the disease. Of all the diagnostic criteria, the sharply localized pain and the roentgenographic picture, which appears to t. pathognomonic in many cale, are the most important.

Differential diagnosts O tool osteoma must be differentiated from () sclerosing non appurative osteomyelitis of Carre () Bro lie's intracortical bone abscess (3) osteo genic sarcoma and (4) Ewing endothelial mycloma

An o teoid osteoma of the shaft cortex of a long bone such as the tibia has been wrongly diagnosed as sclero ing nonsuppurative ostco myeliti Une of our case (Ca e 4 Fig. 10) is a typical example of this error by both the chinician and the patholo 1 t It wa only through a critical examination of the greatly thickened surgically removed cortical slab of bone by serial \riy film with different ex po ure intensities by Co onel d Lorumer of the Array School of Roentgenology of Mem phis that the small ridus representing the o teoid o teoma was found. A preparation was then made which revealed microscopic ally osteoid osteoma. The microscopic sec tion was poor due to tarked desiccation as a result of the specimen having remained out of tixative solution for a long time

Microscopically osteoid osteoma may be differentiated from osteomyelitis of Garic and Brodie's abscess because of the ab ence of an inflammatory cellular reaction and by the presence of the typical tumor tissue

There is little to support misinterpretation of osteoid osteoma as an osteoblastic osteo genic sarcoma but to one unfamiliar with it microscopic picture consisting of much em bryonal osteogenetic connective ti sue marked osteoblastos: osteoid calcified osteoid and atypical osseous tasue there is some ground for such an error Roentgenographic findin 5 usually render valuable aid in avoidin such an error The only reason for mentioning Ewme 5 tumor is becau e of the similarity in the early sclero is produced by both patho lo ic proce es as revealed roentgenograph ically especially when Ewing's tumor appears beneath the periosteum of the shaft cortex o a long bone Of cour e the microscopic evidence i decisive

### PROGNOSIS

The prognoss is uniformly ood provided all of the lesson is excised On the contart, if it is not removed completely pain will continue or recur as the case may be. The prognost therefore depend upon accurate dag nosis, and localization of the le ion and complete extraption of it.

#### TREATMENT

Sur<sub>o</sub>ccal excision of the patholo ic lesion i the retarment of choice provided the are is accessible to sur ery. Moreover it is the only treatment which has hitherto been tried and described in the lit rature. So far as is known no other treatment such as deep roint en thorapy has ever been tried. As the latter seems to have little or no effect upon the printine malignant me enchyme of o teograte arcoma one may a sume that it would have thinked in the surface of the

### CASE REPORTS



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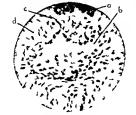
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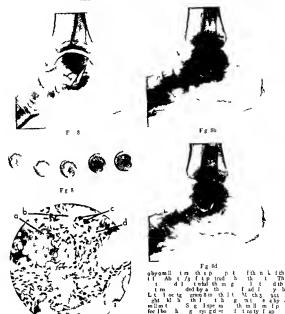
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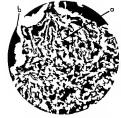
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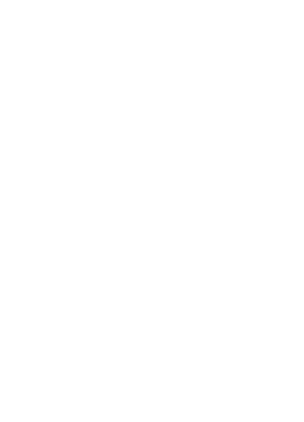
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### CONCLUSIONS

A discussion of osteoid osteoma, a relatively recently recognized di ease entity of bone is considered to be in order as it is felt that it is perhaps frequently overlooked or erroneously diagnosed We have mi interpreted the condition both chinically and hi topatholo, ically

Its diagnosis in the hand of the memor ienced is most frequently confu ed with school sing nonsuppurative osteomyelitis of Garre Readie s hone ab cess and osteo enic sarcoma

Dia\_nosis i relatively easy for one why accusanted with the symptomatolo a phis ical roentgenographic findings and by topath conto

The frequency of this disea e is likely much more prevalent than the literature on the sub-

tect may lead one to believe The age of the patient predominanth m

the econd and third decades of he and the persistent mild to severe localized prin with exquisite finger point tenderness should arouse one to suspect the presence of estend osteom a

If the ridus has developed sufficiently the roent enographic picture may be almost path ognomonic of osteoid osteoma. On the contrary the coentgenogram may be ne atme even thou h symptoms may have been pres ent for months. This type of case should be restudied roent\_eno, raphically at a later date thus givin, more time for the lesion to develop

Physiologic response to the pathologic process varies materially as to whether it i lo cated in spongy bone (Case Figs 5 and 6) or in the shaft cortex of a long bone (Ca e 4

Fig. 12)

The cases of osteoid osteoma herein re ported are presented not with the idea of con tributing anythin, new to the subject but mainly to try to popularize further and to spread the information already known rearding the disease. In this way it is hoped that the disease may be more readily and cor rectly diagnosed and appropriate curative treatment applied when possible which i at this time purely surgical

# BACTERIOLOGICAL STUDIES OF CLOSTRIDIUM WELCHII INFECTIONS IN MAN

With Special Reference to the Use of Direct Smears for Rapid Diagnosis

HILDRED M BUTLER B Sc (Melb) M lb ne A trali

the years since Wilsdon's work 1951 on the classification of Clostridum welchi much has been published on the towns of this clostridium but the amount of work dealing with other aspects is com

naratively small

The miensive work on Clostradium welchur toams must ultimately prove of great value for the understanding of infections in man and has already provided the basis of tests for the rapid identification of the Clostradium welchii (Petrie and Steabben 1943 Hayward 1943 McClean et al. 1943) But its very importance has obscured the necessity for the study of other characteristics of the

organism

Investivations undertaken in this laboratory in a very large number of abortional infections and recently in a small series of postoperative and posttraumatic cases have shown that the capacity of the Clostridium welchit to invade the it sues rapidly is closely correlated with character its other than tougenisty. Con ideration of morphology cultural character it lies its has led to a better understanding of certain aspects of Clostridium welchit infections and to the development of rapid diag mostic methods.

THE DETECTION OF CLOSTRIDIUM WELCHII BY THE DEMONSTRATION OF CAPSULES

Althou h the Clostridium welchn is univer sally recognized as a capsulated bacterium comparatively little use has been made of this property for rapid identification

Stamme for capsules as a means of identification may be applied to smears from cultures and to smears made directly from material suspected of harboring Clostridium welchi

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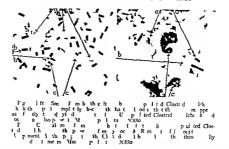
Whether or not strains of Clostridium welchin appear capsulated in culture depends very largely on the nature of the medium. In Wright's broth containing mined veal less than 40 per cent of the Clostridium welchin strains isolated from the vagina are well capsulated but if a small amount of serum or blood is present in the medium approximately op per cent of the strains are sufficiently heavily capsulated to be provisionally identified. In our experience broths made from liver and those containing liver extract or bile are less satisfactory for demonstrating capsules than is Wright is broth.

The presence in the broth culture of other bactena whether aerobic or anaerobic does not prevent the formation of capsules by Clostridia welchi. If the strain is distinctly capsulated very small numbers of bacilli can be detected.

In this laboratory this method has given every few false positive results. Smears of more than 1 000 primary broth cultures have shown capsulated barilli re embling the Clos tridium welchi and 90 per cent of these cultures were proved to contain this organism. Acrobic spore bearing bacilli may occasionally resemble slightly capsulated Clostridia welchin but the frequency of formation of long chains by such aerobes the presence of many spores and the usually granular and faint stanning of the aerobic bacilli reduce this source of

Very occasionally heavily capsulated strains of the Bacillus coli may be mistaken for the

error to negligible proportions



Clostridium welchii since in smears made from cultures containing blood or serum capsulated Bacilius coli sometimes retain the Gram stain and with Muir's method the capsules of both these bacteria tain similarly

Theoretically the Clostridium but ricum the only other known capsulated clostridium could be another source of error. This is of no moment in abortional infections but in cultures from wound where contamination with the Clo tridium but yricum is sometimes common (see MacLennan 1943) this possibility should be borne in mind.

The appearance of the capsulated Clostridium welchi produced in broth vanis-Usually a deeply stained rod i completely or partially surrounded by less deeply stained capsular material but forms in which the capule ob cures the bacterial rod may all o be pre-ent. The latter are very faintly stained and appear as pale blue rectan less or cylinders (Fig. )

In our experience the demonstration of capsulated rod resembling the Clostridium welchi in smears from broth cultures has proved a rehable for rapid diagnoss as the methods which depend on forom production. In addition it has been found that the former method has the advanta e that the medium need not be fee his prepared and when inoculated does not require incubation in the anaeropic rat.

The methods suggested by McClean and associates for detecting in wound evudates the halurodinases and other specific evotors of the clostridia would be more rapid than cil trial method but as yet there; in oreport of their extensive trial in human infection and they suffer from the disadvanta e that they are comparatively complex and call for an eyperienced technical staff.

The simplest method for the rapid detection of the Clostridium weldon is the demonstration of typical capsulated Gram positive rod in smears made direct from the wound or amother site suspected of infection \tot only 1 it the most rapid method but it call for the very manumum of equipment and is particularly suited for the routine examination of large numbers of cases in which an attempt is being made to detect the presence of the Clostradium welchi before the development of chinically recommable infection

Typical capsulated Clo tridia welchii as seen in direct smear are shown in Figures 2104

Among the hundred of specimens exam med in the last 5 years in the laborator) there was only one in tance in which cap sulated rod resembling. Clostridia welching the receptored as present in direct mears when cultures from the same material failed to vield this organism. This discrepancy was probably due to the presence of a heavily capsulated strain of the Racellus cold.



While the us, of direct smears is practically never respon ible for false positive results it does not detect strains which fail to produce stainable capsules when growing in the 11 sues or discharges from the infected area but as will be shown in the next section such strains are u ually not important in human disease. Some of the strains which are not cap ulated in direct smears produce recognizable capsules when growing in suitable broths.

THE EXAMINATION OF DIRECT SMEARS AS A MEANS OF DETERMINING THE SIGNIFICANCE OF THE PRESENCE OF THE CLOSTRIBIUM WELCHILI

In man the mere detection of Clostridium welchii in a wound or other potential site of inf ction is not of great significance. It has long been known that this organism may be present without giving it e to clinically recognizable infection.

Infections following abortion. The chef bac tenological problem in abortional Clostridium welchi infection is the early diagnosis of the severe generalized infections. It has been apparent throughout the 3 years investigation in this hospital that the recovery of the Clo tridium welchii be it from the gential tract the urine the peritoneal cavity or the blood does not decide whether a severi in fection custs or not. The study of smears from the cervical canal however has provided a solution of this problem (2-3)

The significance of heavily capsulated Clos tridium welchie. An investigation of 40 evere Clostridium welchii infections including 32 in which this infection was the cause of death showed that in every case whether character ized clinically by blood destruction or by col lapse heavily or very heavily capsulated bacilli could be demonstrated in smears from the cervical canal In addition these smears showed evidence of destruction of the leuco cytes Recognition of the damage to the leucocytes was found to be particularly im portant While the infection was still early not all the leucocytes were damaged whereas in the late stage of most of the untreated cases nothing but fragments of destroyed cells were seen In the early stage of a severe infection there were always many leucocytes their ab sence later was almost certainly due to de struction and not to any failure of the leuco cytic response This is borne out by sections of the uterus from such cases which in the decidua at least always showed abundant leucocy tes

The smears represented in Figures 3 and 4 were from patients with well established seven infections

In every case in which the symptoms typical of a severe Clostridium welchii infection de veloped after the patient's admission to hos pital and in which investigations were carried out prior to such development the cervical smears suggested a severe infection before it

was possible to arrive at a chinical diag

In more than 1,0 control cases 1e tho e in which infection with the Closterdium welchin was localized to the contents of the uterus or those with Clostridia welchit in the blood stream but without the symptoms characteristic of a evere infection due to this organism there was not a single instance in which the smears showed heavily cansulated f losterdia welchi as well as damage to the leucneytes Fourteen patients in the group had mears in which there were many capsulated Clostridia welchi but in each instance recovery took place without specific treatment for Closterdia welchn even though a patients showed one or other of the symptoms usually associated with the evere infections

When there were only a few capsulated Clos tridia welchi in the cervical smear their significance was sometimes in doubt since in the early stage of the severe infections the leuco cytes usually appeared undamaged when only a small number of the Clostridium welchin was pre ent. Reference to the apparent size and tructure of the capsules was helpful in a sessing such smears. In the severe infections the smears alway showed forms with the capsule around the bacillus at least as wide as the rod tastelf and frequently very heavily cap ulated bacilly with the width of the capsule greater than the rod.

In smears from the cases with blood destruction the dimen ions of the majority of the capsulated rod were to  $\mu$  in length i to  $\mu$  in width and the fragile capsular mate rail at the soles of the rod varied from i to i  $\mu$  in i cases however the Clostindia welchin were larger many of the bacill being  $\mu$  in length and a few lon er. In smears from the severe infections characterized by collapse the dimension were different. Approximately half of the bacilli were found to measure  $\mu$  length with a width variving from 0.5 to 0.8  $\mu$  and the width of the cap ules ranged from 0.8 to  $1.8\mu$ 

In addition to the e-types of well capsulated Clostridia welchii there were forms similar to those already described as occurring in broth cultures (Fig.) in which the cap ule completely ob cured the rod. These ob cured forms varied in length from 1.3 to 4# and in width from 1 to 2.5# Originally all the obscured forms were regarded as heavily capsulated and therefore su, gestive of the presence of a strain suffice ritly invalue to cau, e. e. vere infection. But it is now apparent that only those obscured forms not less than 2# modify the sufficiency between the sufficiency of the comparatively lon and nar row obscured forms (usually 2 to 4# bir 16 or with the sufficiency of the su

I a) are not highly invasave. Even when these points of differentiation are borne, in mind repetition of the smeari-often necessary, to determine the simificance of a fix capsulated Clostridia welchin in the cervical smear. The number of Clostridia welchin to be seen in the smears and the dama, e to the leucory tes will increase rapidly if the strain is sufficiently invasave to care easevere infection. In some cases a dramatic change occurs in a few hours in others a period of iz hours rarely loner may elapselefore a smear typical of a severe infection.

The significan e of inteapulat d Clastidium aclehii. The presence of uncapsulated Clothdia welchii in the cervical smear even in lar enumbers is of no senous import. Not one instance of a severe Clostrahum welchii infection was recorded among more than too case with Clostrafia welchii in the gential tract in which only uncapsulated rods were present in the cervical smears.

The effect of other bacteria. The pre ence of other bacteria does not interfere with the recomment of the de ree of capsulation of Clostridium welchii strains. Figure 2 sho s typical capsulated Clostridia wel hii in the pressure of many loci.

Very lew of the bacteria other than CI totha velchiu which are associated with abor tonal infection caue appreciable damage to the leucocy tes. Of the aerobic bacteria only the hi hi virulent trains of the Streptococcu haemolyticus. Group \(^1\) cause significant cell destruction and this not often. The presente of such streptococci hould not be a sensi source of error in e the majority of the highly virule it strains of Streptococcus haemoly lice. Group \(^1\) can be recognized by their haxy.

capsules when a smear 15 stained with Leish man s stain (5)

Of the anaerobic bacteria other than Clos tridia welchii only the Clostridia septique was observed to cause damage to the leucocytes and only some strains possess this property In a out of 6 cases harboring both these clos tridia a severe infection with Clostridia welchn could be excluded because of lack of damage to the leucocytes although in one instance the Clostridia welchii were heavily capsulated In the other 2 cases the smears showed consider able damage to the leucocytes but in one the Clostridia welchii although heavily capsulat ed were more readily phagocytosed than is usual in the severe Clostridium welchii infec tions for this reason the case was regarded as primarily an infection with Clostridia septique The smears from the remaining case showed in addition to the leucocytic damage the cap sulation and resistance to phagocy tosis typical of the severe Clostridium welchn infections In this instance the Clostridia welchis were considered to be of greater importance than the Clostridia septique

The reliability of cervical smears for the diagnosis of the severe abortional infections due to Clostridia welchii can be gauged by the fact that in this hospital during the last 3 years no patient has been trated for a Clostridium welchii infection unless the cervical smear sugge ted that the infecting stram was highly invasive and during this period in fattent who failed to show typical smears died from a Clostridium welchii infection

Corridation of symphoms with certain characteristics of the cer real since. Not only 1 there this close correlation between the seventy of infection and the appearance of the certical sincer but there are further points of difference in the sincers corresponding to the patients outstanding symphoms. In cases in which gross blood destruction occurred the majority of the Clo tridia welchin in the sincers were short stout red lying singly or in pairs and the capsules were fragile (Fig. 3)

In cases in which collapse and not blood destruction wa outstanding the Clostridia welchin vere quite different in appearance they were longer thinner and the capsules had a clearly defined outline (Fig. 4)

Further evidence of the association between collapse and the thin type of Clostridia welchii was afforded by the observation that in a few of the abortional cases with a mild localized Clostridium welchii infection signs of shock developed for which there appeared no cause other than that of the infection. In these in stances the Clostridia welchi in the cervical smears were long and thin.

These various correlations offer strong support for the view that the nature of the infect ing strain is of prime importance in determining the severity and type of infection. The results of cultural studies to be discussed later also support this opinion.

Postfraumatic and postoperatic infections. Although direct smears have been examined from only 16 wounds harboring Clostridia welchin it is already clear that heavy capsula tion rapid increase in the number of Clostridia welchii in serial smears and damage to the leucocytes point to an actively invasive in fection. Conversely poor capsulation failure of Clostridia welchii to increase rapidly active phagocytosis and lack of leucocyte damage all indicate that a severe invasive infection is unlikely when two or more of the efactors are observed they constitute very strong evidence against the diagnosis of Clostridium welchii aga granterne.

In smears from this series of wound infections the criterion of heavy capsulation was the same as that already described for the abortional cases. As with the latter infections obscured forms that were long and narrow were not con idered to be sufficiently well capsulated to indicate the presence of an invasive strain.

In 3 cases of rapidly fatal gas gangrene 2 following minor injuries the smears re embled those of the severe abortional infections. In the other 3 case of gas gangrene from which smears were examined the amount of lecco cytic damage was less than in the fullminating wound infections and in the severe abortional types.

In 3 cases of localized Clostrilium welchii infection unaccompanied by severe toxemia the mears showed a few heavily capsulated lacilli in 2 and a moderate number of the long thin type in the third but the leucocytes

TABLE 1 -SUMMARY OF FINDINGS IN 16 CASES

Cha	cs f t	m	6_1	ge f Inc 1 and Ci 1 hi	* "d1	
ct * 1 6	Cap× t	[m Luores	El wells	seve n	ct 1h	
М	lf vv	+				
ı	La b	-				
F	H vy	-				
F	La b.	-				

were not appreciably damaged. In 3 cases in which the Clostridium welchu appeared to be mere contaminants in the wound and were probably only multiplying in dead tissue the capsulated bacilli present were of the long obscured type and were unaccompanied by evidence of leucocy tie damage. There were 4 other cases without clinical signs of Clostridium welchu infection in which Gram positive bacilli resembling this bacterium were not een in the direct smears although the Clo indium welched was cultivated from the same material. The hindings in these 16 cases are summarized in Table 1

The presence of heavily capsulated Clostrula welchin in a smeat taken from those areas of a wound where spread of infection is suspected should probably always be regarded as suggestive of gas gangrene but repetition of the smears may be necessary to determine the elucocytic damage and should always be un dertaken when only a small number of Clo trudia welchin are present

If the repeated smears show only a few Clostridia welchii this is an indication that up to that time a severe infection due to thi or gamen has not developed. Increasing, dama, et to the leucocytes in the ab ence of an increased number of typical Clo tridia wickin should be regarded only a indicative of a severe infection with this organism if the smears fail to reveal the presence of other hi hly pathogenic bacteria. Caution is needed in interpreture an increased number of Clostridia welchii in the absence of recognizable damage to the leucocyte. Such a finding might be compatible with the early stagges of gas eaugreene but is

certainly not typical of a well establish d

MacLennan in his article on anaerobic in fections of war wound laid particular tre on the need for differentiation between ga gangene (clostridial myositis) and the type of clostridial infection which is unacromaled by severe toxemia (anaerobic cellulat). The experience of this laboratory su gests that these two canditions when due to Clostridium welchin infection could probably be distinguished by reference to the type and etited capsulation and the state of the leucocyte as revealed in statuned smears.

I have not seen an instance of uncap ulated Clostridia welchii in the smear from a wound but it appears probable that such strains are unumportant

THE BEHAVIOR OF THE CLOSTRIDIUM WELCHU IN CULTURE AS A GUIDE TO THEIR SIG-NIFICANCE

Infections following abortion Work carried out in this laboratory has shown that culture of the variants of Clostridia welchu re ponsible for the severe injections possess certain char acters tics which help to differentiate them from the strains which are relatively harmles (1 3) The strains associated with the severe infections have invariably been very heavily capsulated when grown in Wright's broth containing minced yeal while nearly 90 per cent of the strains i olated from cases without symptom of a severe Clostridium welchi in fection have shown much less capsular mate Indeed more than half of the latter strains have failed to produce any but the smalle t amounts of stamable capsular mate rial when grown in the ab ence of grum. The c statement are based on an examination of more than 800 strains

These results confirm the conclusion drawn from the examination of direct streams that only heavily capsulated strain cau e seriou infections

Keppie and Robertson (1944) workin with 3/ hour cultures of Clo tridium welchin strains grown in a broth containin both erum and gluco e and usin the India ink method (negative staining) to demonstrate cap ula tion concluded that an arrow capsule indicated good tou eme ability a wide capsule in most cases poor toxigenicity. Using this technique they found that strains present in wounds as harmless contaminants showed the widest clear zones around the bacilli

This finding must not be interpreted as being opposed to the view expressed in this paper that the heavier the cap illation the more likely is the strain to be highly pathogene. In all work in this laboratory cap ula ton has been demonstrated by staining the capsules by the method of Richard Mure and not by the negative staining of the India inhemethod. When these two method are applied to the same series of cultures the apparent width of capsule around the bacterial rod is not always the same.

In a recent experiment in which smears from young cultures of o strains of Clos tundium welchin were examined by both meth od the risults were di crepant with 1,3 of the strains 7 showed medium or wide zones, while like the but only narrow cap ules with Murs stain and in 8 smears the reverse was observed.

Growth characterities re istance to phago cyto is and to a small extent \( \alpha \) town production in culture allo serve a indications of the si miscance of a strain of Clostridium welchii

si nincance of a strain of Clostridium welchii The mo t useful growth characteristics were outsined by using Huntioon hormone agar plates (containing rabbit s blood) and serum neop ptone water (50% horse erum) Detail of the method and of the results have been

publish d (1 3)

All but 3 of 40 strains causing the severe in he tions with blood d struction gave smooth surface colonies nongranular growth in the erum neopeptone water were resistant to pha ocytosi in defibrinated human blood and were active producers of a town (the oth r toxin of Clostridia welchii were not studied) Five strains associated with infection characterized by collapse were unstable in re, ard to colony form the predominant typ was smooth or intermediate smooth but flattened colonies with ringed edge were al o present These strains produced a granular depo it in serum neopeptone water were re re I tant to phagocytosis and produced com paratively little a toxin

The correlation between severity of infection and any one of the above characteristics was not absolute. Of 8 strains which had not given rise to a sever, infection 57 (6%) gate smooth surface colonies and a nongranu lar type of growth in serium neopeptone water thus resembling the strains causing the major ity of the severe infections. Similarly 30 per cent of strains not associated with severe infections were resistant to phagocytosis. But only 5 per cent of the strains which had not caused severe infections were very heavily capsulated in broth produced smooth surface colonies and were resistant to phagocyto is

Certain individual findings however do heard a strain as harmless. A strain which when first isolated produces no capsular material in Wright's broth has not yet been found respon libe for a serious uterine infection Similarly a strain that produces only completely rough flat colonies or one which is very readily phagocytosed when freshly isolated can be ruled out as a cau e of uterine infection that is capable of producing clinical signs

Posttraumatic and postoperative infections. Tests similar to those used for the cultures from the abortional cases were applied to the Clostridia welchii isolated from 6 cases of infected wounds.

In 8 instances the patient suffered from gas gangrene due primarily to infe tion with this organism. In 7 the Clostridium welchin was the only clostridium isolated in the remaining one the Clostridium biferimentans was also pre ent. Considered as a group the Clostridium biferimentans was also pre ent. Considered as a group the Clostridium biferimentans was also pre ent. Considered as a group the Clostridium biferimental inferimental consideration from the strains causing the rapidly fatal collapse. Cases

In smears from cultures the bacilli were stout square-ended and heavily capsulated On the Huntoon's plates only a strain gave perfectly smooth surface colonies 6 were un stable producing either smooth or intermediate smooth colonies a proportion of which showed flat rough outgrowths the remaining strain produced intermediate smooth colonies only A nongranular type of growth was proonly A nongranular type of growth was pro-

TABLE II —SUMMARY OF FINDINGS IN 26 STRAINS

a	a.	ns es f	ı	-			
c	I h	S et	Res  pha o-  y on 10  b m  d b  blood	K ) p Cl g sea	Illoc I scitCl Ib f th	am ed h Cl	Sact le fec ed se de le fec ed
H	'n	S IS	+				
11	'n	Uns th S IS	7	6		3	
И	vy	1 ta!	=				
н	٧3	IR.	+				
15	13	18	=				
SI		15					3
Sì	ъ	1 R.				3	

S Smoot IS I rmedia moot

duced in serum neopeptone water some times with a flaky deposit. These strains were resistant to phagocytosis and were with r exception active producers of  $\alpha$  town

Two out of 3 strains isolated from cases of localized Clostridum welchii infection unaccompanied by severe toremia differed from the strains associated with gas gangrene one by producing intermediate rough surface colonies and a granular type of growth in serum neopeptone water and the other in its susceptibility to phagocytosis.

Of 7 strains which appeared to be mere con taminants of wouth 3 could not be distinguished in culture from those of the gas gang rene cases but me each instance direct smears showed that neither the caspulation nor the leucocytic damage was typical of a severe in fection. The other 4 strains were only slightly cospulated in broth and readily phagocytosed 3 of these strains produced intermediate rough and x intermediate sough to surface colonies.

The remaining 8 strains of Clostridia welchin in this senes were from infected wounds which also showed other clostridia the details of which were not available to me. Three strains resembled those associated with the Lnown cases of gas gangrene due to Clostridia welchin but the other; were readily phagocytosed and 4 were poorly capsulated. This suggested

that in 5 cases of which were fatal gas gangrene it was anaerobes other than Ch tridia welchii which were the important in fecting, agents

The findings in regard to capsulation in broth culture surface colony form and restance to phagocytosis of the 46 strain-isolated from wounds are summarized in Table II reference to which suggests that these characteristics are a less reliable indication of the significance of the Clostridium weldin in a wound than the appearance of the direct

In 1 case in this series gas gainvene was accompanied by jaundice and hemo lobnium accompanied by jaundice and hemo lobnium smarts infections in which both the direct smears and the cultural characteristics of the infecting strain were indistin unshable from those of the severe abortional infections with blood destruction. A further parallel was the recovery of the Clostridium welchii from the blood and urine during life.

#### THE MODE OF DEVELOPMENT OF CLOSTRIDUM WELCHII INTECTIONS

The studies of abortional infections showed that the invasiveness of the infecting strain was of paramount importance in the development of the severe Clo tradium welchi infections. This finding coupled with the obsertation that many freshly isolated strains of the Clostradium welchi were pathogenic for voices pigs when a town free inoculum was used focused attention on the mode of development of infection in man (a).

In the past our understanding of Clostndum which in infection has been retarded by too much stress being placed on the sind cance of the evotorins. It was assumed that the bacilli themselves were not musure and that therefore their introduction into wound caused serious infection only in the presence of considerable tis ue dama e of foreign bodies of interference with the blood supply, etc.

The occurrence of gas gangrene due to Clostridia welchit often of a fulnunatin type followin the hypodermic injection of a bland substance or after any other trivial injury is evidence that with some strains the mere in

troduction of the organisms into the tissues will initiate a serious infection

The recent papers of Robertson and keppee (1941 and 1944) show that town production alone as measured by in titro tests does not satisfactorily explain the behavior of Clos india welchii when present in wounds and noir experience town production alone has not provided a satisfactory indication of the sever ity of the abortional infections

Two other observations support the hypoth ess that the Clostridium welchi in its attack on human tissues is not dependent only on its power to produce lethal evations in general reveals certain points of similarity between the fulliminating infections with Streptococcus hae molyticus Group A and those due to the Clos and the full manage of the files of the commercial contains welchild in both the infection becomes rapidly generalized and positive blood cultures are usually obtained in the early stages of the illness in both there is a correlation between seventy of infection and intense cap sulation of the infecting strain

Second the exotorums of Clostridia welchin are weak in comparison with those of some of the other highly pathogenic clostridia and yet gas gangrene due to Clostridia welchin usually develops more rapidly than do the infertions caused by the other anaerobes. This latter observation is in keeping with the wew that the Clostridium welchin is a potentially in vasive organism because of its possession of a capsule

In a previous publication I have suggested that a better understanding of Clostindium whethir infections is afforded if we regard the strains of this organism as divisible into group; according to the invasiveness of the backlib themselves. A study of some hundrids of frieshly isolated strains of Clostridia welchi and a consideration of the lesions which are produced in the patients by these organisms has led me to suggest the following 3 groups.

The first and most important group consists of those strains which are so highly unsaise that they can attack undamaged ussue Judging by the experience of this laboratory the majority of such strains produce smooth surface colonies are extremely heavily cap

sulated and are completely resistant to phago cytosis. These highly invasive variants are comparatively rare

Second there are strains of moderate in vasive power they do not readily invade undamaged tissue but apparently can spread rapidly in damaged areas, where they produce sufficient exotoxin to damage adjacent tissue and thus cause a spreading infection. In the absence of extensive tissue damage strains such as these are unlikely to cause serious infection in man These strains show some but not all of the characteristics of highly invasive variants. They are heavily can sulated although as a group less so than the highly invasive variants and are either com pletely or moderately resistant to phagocy tosis by human leucocytes As a rule they do not produce typically smooth colonies on Hun toon's hormone agar plates after 48 hours incubation

Third there are strains of low invasive, to be apparently multiply only in dead tissue and cannot invade adjacent areas even if these are damaged by toxin so that a spreading infection is never produced by such strains. Usually, these strains produce rough colonies are poorly capsulated and readily phagocytosed. Occasionally a strain of low in vasiveness possesses one but never several of the characteristics of more virulent organisms.

Work on the mysay eness of the Clostridium welchin strains is still in progress and further expenence may well modify some of our present opinions but not I think our view of the importance of the invasiveness of the Clostridium welchin bacilli and of the practical aginificance of the degree of capsulation and damage to the leucocytes as reversed in smears from the possibly infected area

The importance of the invasiveness of the Clostndium welchin part from the evotovins produced has received scant if any attention from recent writers. MacLennan (1943) in his articles on amerobic infections of war wounds did not stress this point with the result that some of his view, are almost certainly not applicable to infections caused by the Clostndium welchi alone.

For example this author's statement that the clostridia are primarily and essentially saprophytes is too sweeping as long as the Clo tridium welchii is included in the group hpart from the yperimental evidence I find it impossible to regard the Clo tridium welchii as c schitally a saprophyte in view of first the occurrence of rapidly fatal infections following hypodicimic injection and second the occurrence in the presence of severe abortional infections of invasion of the blood stream in the early stage of the disease is usually in the absence of extensive damage tashes when the surface of extensive damage tashes when the surface in the presence of extensive damage.

The vi w that the development of Clos terdium welchu infection in man is largely dependent on the invasiveness of the bacilli them elves has an important bearing on other point rai ed by MacLennan. This author n interlout that neither in presention nor in treatment had much advance been made in the last 25 years in pite of the increase in the not n v of antisera While this statement was made in regard to gas gan rene generally available i vidence shows that it is particularly true for Clostridium welchii infections. This fact is another argument against the bypoth e is that the toxigen; its of the infecting or \_anism i all important Once it i realized that in the sev re types of Clo tridium v lehn infection the invasive power of the bacilli themselves i of considerable import ance it is apparent why improvements in anti era have not produced startling results In earlier work carried out in the laboratory it has been hown experimentally that in vasiv ne s is only partially influenced by antitosin

Arain VacLennan stated that on the octical ground gas canciene should be emmently preventable by urical method alone yet such has certainly not been the cas. Clearly here is another good reason for dicarding the old idea that Clostridia welchin beaulit themselves are nonvirulent and there fore cannot invade any but grossly damaged to use

## ALPLICATION TO THERAPA AND RESEARCH

The earlier ections of thi paper has de surfed the use of direct smears and to a le crestent the use of cultures for the rapid to an of Clo tridia welchi and as a

means of determining the significance of the

These tests can therefore be used as a mile for treatment. In a case with clinical miles agas gangene or other type of clostedel tection smears typical of a evere infect with Clostroids welchin will indicate the red for instituting full treatment again the gainsm whereas if the smear does not the earlier of the contract of the smear does not the earlier of the smear index of the patient's symptoms. Thus a more exterior examination of the smear may how lostroid forms resembling Clostroidium septique or an infection with an aerobic streptococci or the Streptococci or the Streptococci is hemolyticing Group A.

Direct smears should play a lar epart intemana ement of the case in which the Cl tudium welchi is detected in a would bit which at that time doe not show clinical is of gas gamerene. In such cases it would be logical to withhold specific treatment as I ras the smears did not sug est an acticly mass emigration.

Only limited use has so far been m de of direct smears MacLennan (1043) tre sed the usefulness of a Gram stained smear in the diagnosis of gas gangrane But if the Clotridium welchi is the infecting organi m thi 1 not enough in such case it is essential to use a stain which shows the cansules and dis not di tort or fail to stain the leucocytes. In the Medical Re earth Council's War Memorandum on gas gangrene (104) the 1 mf scance of the findings in Gr m stained means from wound was d scussed in one detail but no mention was made of the demonstration of Clostridium welchii capsules to determine either the presence or the agniticance of the clostridium Reed and Orr (104 ) in their ar ticle on the progre s of medical science in re lation to gas gangrene mentioned the makir of Gram stained smears at the ame time as attempts at cultivation were undertaken but did not sug est the use of direct mear for the rapid diagnosis of Clostridium welchii irfec

Fadure to recognize the importance of bac teriological method for the diagnost of severe Clostridium welchit infections 1 apparent in two recent articles on puerperal infections In that of Rendle Short (1942) the criteria for the bactenological diagnoss of the severe Clos tridium welchii infections were not discussed and in Salm's paper. The Occurrence and Siemficance of Clostridium Welchii in the Fe male Genital Tract (1944) no mention was made of any laboratory method for assess ing the significance of the presence of this organism.

To determine the value of any particular form of treatment in serious Clostridium welchiu infections knowledge of the invasive ness of individual strains is essential. Any claim of success is quite without justification if cises are included in which the Clostridium welchii detected lacked the necessary in 1881/1005.

Anowled e of the invasiveness of individual strains is also umportant for the evaluation of prophylactic measures. Without such an as sessment exaggerated claims may be made since any method will succeed if only harm les strains are present.

Since in the severe Clostridium welchin in fections the invasiveness of the bacilli them selves is as important as four production treatment should be directed against both a pects. There can be little doubt that antitorun must be employed in all Clostridium welchin infections that warrant treatment but in cases in which the smears indicate the presence of a highly invasive strain therapy with an antibacterial agent effective against such variants is also necessary.

In planning experimental work designed to test therapeutic substances full consideration should be given to all the properties of the strain used as the infecting agent. In a previous article (4) I have pointed out that many of the reports dealing with the treatment of experimental Clostridium welchin infections with the sulfonamides prove but little since the strains used were not fully described and the time clapsing since their isolation was not given

This latter point is most important. Work in this laboratory has shown that many result of clated strains of Clostridia welchn from hu man sources are pathogenic for guinea pig when washed cultures are used. But this property is fairly rapidly lost with some strains

in less than 3 months. Similarly, re: tance to phagocytosis by human leucocytes may quickly disappear during artificial cultivation.

Further evidence of the necessity for using resally isolated struins has been provided by recent experiments in rats carried out in the laboratory. When rats were infected with a freshly isolated strain from a fatal abortional infection the administration of antitoxin alone failed to save more than a small proportion of the animals while treatment with both antitoxin and an antibacterial agent was highly successful. Repetitions of the experiments over several months showed a dicrease in the virulence of the strain as evidenced by an increasingly larger proportion of survivors in the group treated with antitoxin alone.

#### SUMMARY

- r The rapid identification of the Clostrid ium welchii by the demonstration of stained capsules is described. The method has been successfully applied to smears from broth cultures as well as from tissues suspected of harboring this clostridium.
- 2 Methods for determining the significance of the presence of Clostridia wilchii in relation to abortional and posttraumatic infection are discussed. In both types of infection it was found that the degree of capsulation to with the extent of the dama\_e to leucocytes as revealed in direct smears provided a reliable indication of the sevently of infection. It is concluded that the examination of mears from the su pected infected \_rea is the most rapid and most reliable means for the bac teriological diagnosis of the severe types of Clostridium welchi infection.
- 3 The development of Clostridium welchis infection in man is discussed and it is suggested that the invisivent of the bacilli themselves apart from town production largely conditions the occurrence of climically recognizable infection
- 4 The application of these methods and conclusions to therapy and re earch is indicated

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# AN EXPERIMINTAL EVALUATION OF AMERICAN COMMERCIAL BIVALENT AND PENTAVALENT

# GAS GANGRENE ANTITOXINS

IVAN C HALl Ph D New York New York

REVIEW of the history of malignant edema and gaseous gangrene (2) shows that most surgeons who have had experience in the use of gas gangrene antitorium favor their use but there have been a few who have not been so impressed One suspects that in some instances those who have condemned the use of serum have failed to distinguish between its prophylactic and therapeutic values that perhaps in some cases the serum has not been used until symptoms were far advanced and then in quantities too small to be of value or under other unfavorable conditions.

This writer believes that gas gangeren serum is not needed at all for wounds which receive prompt adequate surgery that its principal value is prohjalectic to prevent or delay anaerobic infection until adequate surgery can be secured that it can never take the place of adequate surgery and that for these reasons it is much more important in relation to war wounds than in relation to civil aim wound. But the believes also that it has definite therapeutic values when used in adequate dosage as an adjunct to surgery in the treatment of malignant edema and gaseous gangeren due to anaerobic bactill.

Eatly in our study of civilian wounds the water was asked to make a study of commer cal gas gangrene antitorins. Specimens of these were furnished by seven manufacturers. They came in small rubber capped bottles or syringes each containing one therapeutic dose. The different brands will be designated by the letters A B C D E F and C.

The contents of these containers were in all cases clear or only slightly opalescent liquids and remained so on storage in an electric re lingerator for more than 2 years without any visible evidence of deterioration. All of the tests were made before the dates of expiration printed on the labels

Serum B the only penta alent antitoxin had the following stated potency

all	perfinns tit m septicu antitom h t lyte anti v	oco un ts oco un ts 3 oco nit
Bacil Bull		500 t 500 ts

It is to be understood that these are international units but as I have recently shown (3) no two of these standard international units are defined alike in terms of minimal lethal doses of town neutralized Granting that it is possible to define antitorin units in terms of minimal lethal doses only approximately we find that the approximate protective power in terms of mouse minimal lethal dose of towns which are represented in this therapeutic dose of antitorin is as tabulated in the following:

Bull perf ge tu 500 600 t 760 000
Bell epiteu tu 400 600 t 64 000
Bell sell hilyteu tu 800 t 35 000
Bull yn tu 80 t 17 500 000
Bull dii u 28 000 t 50 000

All of the other serums were bivalent each therapeutic dose containing 10 000 units of Bacillus perfringens antitoxin and 10 000 units of Bacillus septicus antitoxin

## EXPERIMENTS ON BACILLUS PERFRINGENS

Since Bacillus perfringens is the commonest single cause of gaseous gangrene experiments were started in the first place with toxin and subsequently living cultures of this micro organism were used

TABLE I —PROTECTIVE ACTION OF GAS GAN

GPENE ANTIONIN AGAINST TOXIN OF BA

CILLES PERFRINGENS

-	D	ft	ti	d	f t to	
Gui m be	N h	Dose f ts	<erum< td=""><td>Dix f se ur</td><td>Le ms</td><td>F 1</td></erum<>	Dix f se ur	Le ms	F 1
66	3		=	=	Eise by nep-	Rec very
63				E	leti dx on	Rec ty
6			-	-	M t ded m [ sch	Rec 17
	5	5	-	-	M i te d'm I dh scab se ia	D i
	3		4		\	L d
			В		`	E ved
6			С		7	L d
6			D		7 h as fem	L d
			E		`	L d
	200		F		×	ા લ
_56			G			L ed

## ENPERIMENTS WITH THE TONE OF BACILLIS PERFRINGENS

A town prepared by Dr. M. A. Logan of the University of Cincinnati was supplied. It was packed in re. and hipped by airplane July 18 193. This town is a stated to contain about o'ro units of alphis town per cubic centimeter as determined by Van Hevningen's method in 10.0 It was said to he e-been preserved with pheny limercuric accetate and appeared as a clear light olden hund with a light sediment of crystal re-embling those of tyro ine It was sterile. We ilways stored it in an electric refrigerator kept at degrees C.

July 1042 a gumea pig weighing 60, orams as injected with a cube centimeter of this town subcutaneou h. This animal developed marked subculaneous celema with lique frim? necrosis overni ht. On the follo ving day the celema was apparentt; substading but the animal wax very sick and died about noon. Its belly well wer's full of ma out but there is no evidence of penetration of the abdomen. The abdominal viscera appeared to be a rimal but the lungs were conceited.

TABLE II —PROTECTIVE ACTION OF GIS GIN GRENE ANTITOXIN AGAINST TONIN (T.B.) CILLUS PERFRINGENS

,	LLLLU	3 FL	KI KL	AGE V	٥						
-	Dos fitte dose fatit n										
er P m be	R h	Dose f	Serum	Dos	ı	F 1					
5			-		Ed m 1	De 1					
8	55	5	-		M k d d m l nu l es- ha bd l ped r	Dead da					
8	5			-	M i d i	R on d					
8	3	5	=	-	I k d d ly d sch schotal peri	E i					
4	- 3		٨		<u> </u>	L ed					
90			В		λ	L d					
86	لـــا		_ C	Ĺ.,	`	L đ					
			D		\	L d					
85			Σ		/	E d					
_			F		`	Lĸ					
	1		G		h	L d					

A smaller guinea pio weighing 45 grans was injected subcutaneously with 1 cubic centimeter of the same torun boiled 2 minute. This animal developed overni ht marked subcutaneous edema without liquefaction but recovered.

A gunea p<sub>b</sub>, weighing 2 g grams inoce lated with of cubic entitleter of unbulled for in subcutaneou by developed marked edem overin ht which became severe at 48 hours At 72 hours there was lequely in necross and at 66 hours the skin ruptured after which are scharf formed. This scar sloughed in 16 days leaving a clean healthy granulatin area which eventually healed

A gumea pig wei, him 205 gram given o or cubic centimeter of town had a moderate edema and followed a crurse to recovery similar to that of the preceding animal

Experiment 1 October 14 a sene of guinea pigs was injected with firshly made mixtures of 1 cubic centimeter 3 this town and 1 cubic centimeter of the art w run. Four control animals all but on, h a wer than the excerving mixture received graded dees of town alone Table I summarizes date.

TABLE III —PROTECTIVE ACTION OF GAS GAN GRENE ANTITO'NIN AGAINST TO'N OF BA

			TALL			
	Dose	fTx	c	Dos	e of titoxin	c.c
Gu ra	N h	Dose to	Serum	Dosé f rum	L ms	F 1
_	355	_	=	-	Ed m lys rup-	De d hors
6	30		-	=	Mkidm bys had ru lk b	R d
1	3 5		-	-	Mark d dem d day l scha	R d
_	36	5	-	=	f kd dm d da ly scha	R d
	365	1	A		`	E d
_	65	_	В		\ <u> </u>	L d
- 3	355	Γ	c		M k d dem lys p ! k os ra b day	D d
	3 5		D	1	١,	L d
	_	1	F		N	Led
_			F		M kddm hys sch	R I
_	1	$\Box$	0	Τ.	N	L ed

Table I shows that all of the controls devel oped the characteristic edema with subcutane our lyss rupture of the skin in 2 cases re covery in 3 and death after 11 days by second ary infection of an adherent scab in the ca e of the animal that received the smallest dose of torin

One of the test animals developed a slight transient edema none of the rest showed any symptoms

Experiment 2 October 23 194 a series of guinea pies was imjected with mixtures of 1 cubic centimeter of town and o 1 cubic centimeter of each of the antitorins along with 4 of the heaviest animals as controls receiving graded doses of toxin. The data are summar juzzl in Table II.

Table II shows that the test dose of z cubic continueter killed a large guinea pig in less than 22 hours while marked lesions were produced with smaller doses down to 0 1 5 cubic centimeter and 2 of these animals also died later with abdominal perforations

None of the test animals receiving o i cubic centimeter of the various erums howed any effects whatever

TABLE IN —PROTECTIVE ACTION OF GAS GAN GRENE UNTITOVIN AGAINST TOVIN OF BA CILLUS PERFRINGENS

ć	im P m be	II b	Dose	Serum	Dose	7	F !			
-	3	3 5		=		Mark d d ma lys	D d gd ys			
•	3	3 5		=	=	M k d d m lyss dh t sc b	D ad 8 days			
-	33	75				M k ded m escha	Rec ec			
•	37	5	5	-		Wikd dm las rup fki	Rec er c			
•	5	SS	_	A	00	Mode d m	D d hours			
•		55	_	В	00	Ed m ly scha	R c			
,	3		Γ	c		Ed m	D d			
•	\$	Г		D	00	Mod ra ed m	D d n			
	6	5		E	00	Ed m 1	D d n			
•	5	-	1	F		N	L d:			
•		$\overline{}$	1	G	00	Ed m lys seb	R c			
		ofices o	n l	Erm	nm.	1				

Confirming es l Experim 1

Experiment 3 November 4 1942 a series of guinea pigs was injected with mixtures of reubic centimeter of loxin and o or cubic centimeter of each of the antitorins along with the usual controls. The data are summarized in Table III.

Table III shows that the test dose of I cubic centimeter killed a large normal guinea pig in about 40 hours. Guinea pigs receiving smaller doses down to 0.0, cubic centimeter all showed characteristic lesions but recovered.

Five of those receiving mixtures of 1 cubic centimeter of toun and oot cubic centimeter of antitoun showed no result but in 2 in stances this dose of antitoun failed to protein against the development of the usual lesions 1 of these guinea pigs died on the 5th day but the other one recovered slowly

Experiment 4 November 19 1942 a series of cubic centimeter and 0 oor cubic centimeter of 0 oor cubic centimeter of antitorin except that in the ca e of antitoxins C and F oor cubic centimeter was used to recheck the results in Experiment 3 The usual controls were used. The results are shown in Table 1\( \)

TABLE V —SUMMARY OF EXPERIMENTS I TO 4
ON PROTECTIVE ACTION OF GAS GANGRENE
ANTITION. AGAINST TOYIN OF BACHLUS

PERFRINGENS									
be I	Ave	D,	Serum	ת ( 10	L	bа	L d		
	p 25	<u> </u>			T cal				
					Tpul				
	3	5							
	3_		<u> -</u>		Typual				
					Typ cal	-			
	3_				Typ tal	1	-		
					Tpcal				
	- 3				Typ tal				
		L	1		\ <u>\</u>				
	3 '				Ь	- '			
	55				<b>N</b>	-	_		
	5			80	Typ al				
			В		N	-	_		
	_			-	N	-			
	6		1		N				
-	5	-	-	- 00	Typ 1	_			
	_		c		N				
	-	-			N	-			
				_	Typ !		-		
	_	_	p	-	N.	~	-		
					N	-			
_	,	-			<u>N</u>	-			
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		├	F		×				
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	<u> </u>	ــِــا	<u>.                                    </u>	- 00	Typ I	لتا	_		
‡De	ths occurry	ured ctions	d an fadb	ь.	or ikus thand hela tars	babl	đ to		

Table IV shows that all 5 of these errums tested for prophylactic action in a dose of o corcubic centimeter failed to protect guinea pigs against a cubic continueter of Bacillus pering gens toxin. Of the two serums which failed in Experiment 3 to protect in a dose of or cubic centimeter serum Called again here confirm ing the earlier result while serum F protected fully disagreeing with the result in Expen ment 3 Serum Fshould have been tested in a dose of o oor cubic centimeter but this was not done

The results of Experiments 1 to 4 are com-

Table V shows that I cubic centimeter of Bacillus perfringens toxin killed a of a ron trol guinea pigs 2 within 2 and 40 hours respectively 1 in 5 days. One animal in which early rupture of the skin occurred survived and the lesion healed completely in about 7 weeks. Of a control animals receiving a cubic centimeter of toxin one recovered the other developed an adherent eschar which became secondarily infected resulting in death in 14 days. Similar accidents occurred in a guinea pigs receiving o 2 and o 12, cubic cen timeter of toxin while a total of 8 control guinea pigs receiving doses of from 0 0, to 0, cubic centimeter showed the typical early edema and lysis followed by loss of fluid either by rupture of the skin or by slow leaks e and absorption formation of eschars granulation and complete healing in 6 to 8 weeks. In evaluating these controls emphasis is placed upon the characteristic lesions produced by the toxin during the first a hours rather than upon death or survival of the animals then or later as these terminal events are so dependent upon uncontrollable accidents such as early rupture of the skin or later sec ondary infections of the large adherent eschars which always form if the animal survives the earlier effects of the toxin

Five of the 7 brands of autitorin tested gain complete protection against a cubic centimeter of this tourn in doses of o or cubic centimeter or larger. All 5 failed in a dose of o occubic centimeter. Two which gave complete protection in a dose of o or cubic centimeter lated at o or cubic centimeter but one of thee gave complete protection at o or cubic centimeter when retested later these were not tested at o oo cubic centimeter for lack of time.

# EXPERIMENTS WITH LIVING CULTURES OF BACILLUS PERFRINGENS

Experiment | January 8 1043 a series of guinea pig was used to test both the prophy lactic and therapeutic action of serum B against a virulent culture of Bacillus perfrin gens The culture selected was my old Ba cillus welchu No 36 which was isolated in tot8 from a swelled can of commercially can ned Swis chard (4) This culture has been maintained ever since in deep brain medium or deep 1 per cent agar at room temperature and has retained its originally high virulence remarkably well having never failed in all these 5 years to kill overnight guinea pigs with typical lesions in a dose of 1 cubic centa meter or less It always produces a massive edema on subcutaneous injection followed very soon by extensive spreading lysis em physema and death within 18 to 4 hours It belongs to Wilsdon s type A (1)

One cubic centimeter of a 16 hour culture of Bacillus perfringens No 15196 (old No 36) in glucose broth in a constricted tube with marble scal (5) was injected into each of 10 guinea pins during an interval of i minutes The heaviest animal received no treatment at died in exactly 6 hours on autopsy the char acteristic emphysema and lysis were seen. A culture from the heart's blood was sterile The lightest animal received 1 cubic centimeter of scrum B simultaneously at 6 hours there was a slight edema which subsided over night It survived without any visible effect The remainder of these guinea pigs were in jected subcutaneously at intervals up to 6 hours with 1 cubic centimeter or 4 cubic cen timeters of serum B as indicated in the follow ing protocol

G a pig N 150 eight 33 g m d
cube ce tim t of cultu e subc t u h \
tr tm twasg ve Subcuta o semphysema a d
lys were p c e t hut he rt hlood was ste ile \u00e4m
ld datch urs

G capg N 56 weight 245 grm At ho the weight dem nd cub tmt f srumwsgi sheut colly at 6 h seight edm at 4 hors as d fluctut g re 4 b 5 tm ters t d b t a m l pp thy

was not s ck at 48 hours the fluctuat: area was drying up at 72 hours we ght was 225 grams and nee otic e char was 5 centimeters in di meter at 11 days a dry adh rent scab 3 centimeters in d a meter was protected. Lived

Gum a pg No 148 weight 28 grams At 1 hour there was slight dema and 4 cubic cent meters of serum was gve subcuttaneously at 6 hours slight ed ma at 24 hours slight necross at 48 rs the dema was dryang up at 72 h urs the dry a ca of necros s was r centimeter across at rr days no 10 s we entoted Lived

Gu ea pig No 155 we ght 3 grams At 2 hours there was sight ed ma and cube centum ter of serum was g en subcuta cously at 6 h urs moder te edema 1 24 h urs not ill area of high efaction and nec os smeasured by 2 centum ters at 48 hours area of ne cos 3 drying up at 22 hours small dry ea fin cross 1 by centumeters at 1 days about the sam Luved

Gunean planes, weight; a grams. At a hours the e as sight ed ma and a unic centim te a of the e as sight ed ma and a unic centim te a of a te dema at a b ri animal was not all a ea of 1 q deat on and nec osis measured a by a centimeters at a bours area of necess a was dry gup at 72 hours dry at a of necrois was 1 centimeter across at 1 rt days but the ame. Lye across at 1 rt days but the ame. Lye across at 1 rt days but the ame. Lye

Gu apg No 137 weight 3 gg ms At 3 hours there as sight ed ma and r cube centimeter of s rum w g n ubcutaneously at 6 h um mod erate edema at 4 h rs not 11 are of necross ars 2 hy 3 centimeters at 44 h bours area of necross dry ng up at 11 days dry adher nt eschar 2 by 3 c t m ters L ed

Gu ep RNo 145 weight3 gg ams At 3 hours there wa 1 ght edema 4 eubte eentimeters of s rum 5 g vera subcutanousil) at 6 hours moderate edema at 21 hours not ill area f ne oss by 3 et meters was drynag up at 48 h urs dry area of ecross 2 by 3 ce t m ters at rd ys dry adhe ent eschar 2 by 3 ce t m ters at rd ys dry adhe ent eschar 2 by 3 ce t m ters at rd

Gu capgNo 5 weight335grams At6bours me date dema nd emphysema we noted O cubec t m terol serum wasgiv subcutance by Ataab us there w spresent a marked edematous ar a 45 timeter sby 7 e nt meters t ha small full buts me cultimeters are 0. The area waspain full buts me tyz bours two areas of 150 numer about the ame tyz bours two areas of 150 numer of 150 numer areas of 150

eight 335 gram areas dry at days granulat g e 2 ce t m te s b) 3 c ntimet rs L v d Gu nea p g No 53 weight 365 grams \t 6

h is m rked edema emphy ma ad lys s
oted Four cubic c nt meters of serum wege
subcutaneously At 24 hours e of lys s 4 Sc nt
meters by 7 ce timeters pa ni l but a im l appar
thy not sek at 43 hours fluctu tiga a scent
m trisd p Sec timet s by c e timeters
hy 7 ce timeters by c e timeters by c e timeters

m trsd p sce tmet sby se timet rs buint chat72 h rs ab the ame sme b rp

TABLE VI —PROTECTIVE ACTION OF GAS GAN GRENE ANTITONIA AGAINST BACILLUS SEP TICUS

	Dose	fcul	ture	Dose of nut un c			
Gun P 8 um be	gratus	Dove t in	Serum	Doşe seyum in c.	Leg	Fasi	
76	35		=	=	Typ cal	D A ns	
77	3			~	Typ 1	D d bonzs	
73	5			=	×	L A	
75	900	00	~	-	Y	L d	
7	8		A			L d	
6	5o		В		Del y d	D ad g dayst	
6	8		C		h .	L 4	
62	9		D		N	1 4	
6	8		E		Турсы	De i	
6	]		F		1	L 4	
6	1		G		B. se	Lvel	

week p vi us with c. Bacillus perfrangens to intHeart blood h wed pur cui I Bacillus sep cus

tinn ruptu e of ski t 96 hours about the same with t 340 grams at days clean g anulating area 4 cent met raove chest wall halig L ved

It is clear from these data that serum B had not only prophylactic but marked therapeutic action against infection with Bacillus perfirm gens saving the lives of all treated animals in

of which treatment was not started until the

### EXPERIMENT ON BACILLUS SEPTICUS

In order to utilize the animals surviving Experiments 1 and on Bacillus perfuringens these were tested for passive immunity to Bacillus septicus. The culture used for this experiment was my No 3974 which was received in September 19 5 from Dr. J. P. Scott of Kansas State College Manhattan Kansas as Robertson's Vibrion explique No 252 × I. F. Type Later Institute 1023

Experiment 6 October 8 194 a sen s of guinea pies was injected subcutaneously with Bacillus expiticus \o 2397A grown for 24 hour in a 1 per cent alune meat broth me hum in the do-es which are indicated in 15the VI.

The control animals were all fresh and usused prior to this test. the test animal had a received freshly made mixtures of i cubic continueter of the indicated antitoxins with reuber continueter of the torin of Bacillus perfining. In Experiment 1 a week previously Sir dithese had shown no symptoms by the result once guines pt., No. 56 had had a shift tan seart edema.

The results are shown in Table VI

Fahl VI shows that Bacillus septicus lilled large gunea pigs in a dose of o r cubic ceau meter in about o hours while o or cubic ceau meter had no apparent effect. Those an mals which died showed the postmorten subcutaneous and pulmonary congestion edema and inght emphys sem as or characterist of animals dying with infection by Bacilles epticus. The heart's blood yielded pure cit tutes of Bacillus septicus and the character sitte filaments were demonstrated in every in stance upon the surfaces of the livers.

Five of the animals injected with 1 cube contimeter of the different gas garorize we rums a week previou ly were still protected completely 2 ainst a dose of culture ten times as large showing no lesions of any kind and

surviving
One animal which had received eruri B
was apparently well on the 4th day but with
found dead on the 5th day with characterist
lesions and a pure culture of Bacillus sipti wi
in the heart's blood Another which had received serum E died along, with the controls
in about to hours with similarly characteristi
postmortem findings

Experiment 7 October 30 10,2 a similar experiment was made with the gunea proused in Experiment as test animals. They are the received freshly made mixtures of cotoubic centimeter of the various runs with a cubic centimeter of Bacillus perfirm ens torn one week, previously and had shown to symptoms. VII other conditions were the same to cept that a 45 hour meat broth culture of Bacillus septicus 2,07 \ \text{va} \text{ as used.} The results are shown in Table VII.

Table VII shows that or cubic centimeter of the test culture of Bacillus septicus killed a guinea pig in about 4 hours while oor cubic centimeter had no apparent effect.

NABLE VII —PROTECTIVE ACTION OF GAS GAN GRENE ANTITOVIN AGAINST BICILLUS SEP

1	icus Do•	f cult	re c	Do	se f nut wn	cc
kdae Pre m- be	nam i	Dove !	Serum	Dose   f serum	Les on	F
99	3		-	=	Typ t	D dia local
	5		=	=	Typosi	D d 4 hours
_	5	-	=	=	N	L d
_	3 5	T	٨		Typ cal	D d
90	5	-	В		Delay d	Dad 36ho m
86	335	1-	C		N	L ved
_	3		D	1	Typ cal	Dad at
88	3		E		Typal	n d buni
•	3 5	1	F		Typ 1	n d
	,		G		\	L d

the blood sho ed pur cul ur t Banilus se cus

Four of the animals that had been protected against Bacillus perfringens with o i cubic centimeter of antitoxin died in about the same time as the control which received the same amount i.e. I cubic centimeter of culture i died in about 36 hours. All of the animals that died showed the characteristic pathologic changs, aforementioned and yielded pure cultures of Bacillus septicus in culture from the heart a blood.

Two animals which had been inoculated with serums C and G showed no symptoms and survived

Experiment 8 November 10 1042 the gumea pure which had received 0 or cubic cen timeter of the different antitoxic seriums along with 1 cubic centimeter of Bacillus perfringens toum 6 days previously were used. One of these animals still had a large but clean eschar Serium 6 was not represented the corresponding animal having died in Experiment 3 A 24 hour glucose hroth culture of Bacillus septicus 2307A grown in a constructed tube (5) was used as the test culture. The results are shown in Table VIII

Table VIII shows that only one animal in this experiment survived ie the control

TABLE VIII —PROTECTIVE ACTION OF GAS GAN
GRENE ANTITO\IN AG\I\ST BACILLUS SEP
TICTIS

1	D se of cult cc Dose of it xm cc									
Gus ug nh be	Etras	Dose i tom	Sezum	Dos ( scrum	Les ous	E I				
95	5		=	=	Typ cal	De di 7hou f				
-5	3 5	_	=	=	Typ cal	D d bourst				
9	95		=	ĪΞ	N	Li d				
			۸		Typ cal	D din				
- 1	5	$\Box$	B		Typ cal	D ad hours				
_	3	-	c		Typ cal	D ad				
_	65	_	D	-	Typ cal	De d in				
	3	$\vdash$	Е	_	Typical	Dead h rst				
83	Ι'.		F		Typ cal	n d bours				
d	23.2 E C	nously t	ma p	c Br	llus perf gens ox					

fil it blood h dp l [Eacl] se cus
Th animalhadi et l scha belly no ulm mary ngen
pey h it blood cultures le !

which received only o or cubic centimeter of culture. The first control and all but one of the test animals were found dead in 17 hours. The second control guinea pig No. 115 and guinea pig No. 118 died in 21 and o hours respectively.

All of those that died excepting No 118 showed the usual pathogenic changes and positive heart's blood cultures. No 118 was the one which had a large healing seshar resulting from its prior injection with Bacillius perfiringens to un. This animal died in 20 hours hashowed only a moderate subcutaneous edema and no marked congestion either of the suhcutaneous tissues or of the lungs and its heart's blood culture was negative. The observations suggests a possibly adjuvant action.

Experiments 6 7 and 8 are combined in

It would not be fair to compare the sum mary of experiments on Bacillus septicus culture with that on Bacillus septicus town owing to the diversity of factors in volved such as the u e of whole culture in stead of town and the lapse of a weel, is time from the injection of the antitoxin before the cultures were injected. Therefore while a

TABLE IX —SUMMARY OF EXPERIMENTS 6 7
AND 8 ON PROTECTIVE ACTION OF GAS GAN
GREVE ANTITONIN AGAINST BACILLUS SEP

11005									
yaw- pe (	Ave we bt gu: a	Dose f t n in	Serum	Dose f serum	Jes as	Вα	Lived		
3			-		Typ cal				
3			-	-	Typ cal	1	_		
	90	_		-	\	-			
	33		A		`	-			
	5				Typ !	1	-		
	3	_			Typ cal		-		
	80	_	В	_	Del d	1			
	5	-		-	D1 ed	1	=		
	3				Typ cal	1	=		
	1	Ι	- c	_	×	-	-		
	5		_	-	·	-			
	1		_		Typ cal		=		
	5		D	<del> </del>	<u> </u>	-	_		
		-	-		Typ cal	_			
	6	-			Typ cal		=		
			E		T 1		=		
	3				Typ 1	-	~		
	<del>-</del> آ		-		T cs)	-	=		
			F		<u> </u>	-			
_				-	Typ cal				
		-	-	-	Typ 1	-	-		
_	-		ō		N				
-		-			<u> </u>	-			

higher percentage of animals injected with Bacillus septicus died in spite of prior injections of antitoxin it is not possible to conclude that these seriums had less protective action against Bacillus septicus than against Bacillus perfringens. The important conclusion seems to be that all but one serum laid marked protective action against at least 10 fatal doses of culture when given a week previously in a dose of 1 cubic centimeter and in 2 instances in a dose of 0 r cubic centimeter and in 2 instances in a dose of 0 r cubic centimeter. Two serums B and E apparently had slight protective power under these conditions but the next experiment showed that one of these B was by no means devoid of prophylactic value.

One notable difference in the action of Ba cillus epticus and Bacillus perfringens is to be noted Gumea pi, frequently surviv así recover perfectly after having severe kisa 5 from either the tou nor culture of Bacillas spir fringens but they rarely do so after an injection of Bacillus septicus which point on activate and sealilus septicus which point on activate with small doses of Bacillus epit cus often show no signs of illness at all for a day or so but succumb rapidly one infection that is septicemia really starts. In this it spect an infection with Bacillus septicus reembes an infection with Bacillus septicus reembes an infection with Bacillus anthroas:

Experiment 9 January 9 1943 a sense of guinea pie,s was used to test the prophylater and therapeutic value of crum B again Bacillus septicus. Upon analyzing the dialready collected we later realized that the was really one of the two least favorable simples of antitious navailable for such an crum person of the two least favorable simples of antitious navailable for such as the such as t

Each of 12 normal guinea pigs was injected subcutaneously in an interval of 13 minute with 1 cubic centimeter of a glicose broth cell ture of Bacillus septicus 2397/8 grown for 1 days in a constructed tube with marble sel (5) Three served as untreated controls or dosare 2 of these died in 3 hours 1 in 45 hours all with typical pathology and positive beart s blood cultures One received 1 cubic centimeter of serum B simultaneously it never showed any symptoms. The others were treated at intervals by subcutaneous in jection of 1 or 4 cubic centimeter of serum B as indicated in the followin, protocol with the results noted:

Gu pg No 68 we ght 37 grams O cubc e timeter f cult na gi n subcuta usiy An mal w s d ad 3 h urs

Gu capgN 57 we ght 35 g ams O t the c bc cc tumeter i ultu e was gi subcuta

ou ly 1 malwa dead n 3 ho rs

Gu ea p g h 5 w ght 34 grams 0 hun

dedth cubi c ntimete of c liu e was gi c subcu tan u ly At 3 h urs the was sight b tan ons edema An m lw ots L ftw s d ad 45 hours Gieang No 16 wight grms O c bc

criting to felling plus ic be at mete of rum B wr gi s but eouly No east L d

G pgN 66 weght s m so c be

tmt fcult wsone ubc 1 eo sly At

hours the e as sight edema r cub e cent meter of serum B as given subcutaneously at 25 hours sight edema not s ck at 48 hours dry necrotic a ea

I cent meter across Lived
Gu ea pig No 158 we ht 55 grams O cubic

Gu eapig No 158 we in 55 grains O tuois cent meter of culture was g ven subcutane usly At 2 ho rs slight edema 4 cub cee timeters of s rum B we given subcut n sly at 3 hours slight edem not s ch at 48 ho rs dry n ot c area 15

ce t m ter ac os Li d Guinea p No 59 we ght 29 grams One cub c centimete of culture w s gi en subcuta eously ti 4 ho rs 2 min tes slight dema One c b c cen timete of serum B was g en s bcutaneously at 23 hours I ght edema not s ck. Animal 23 d ad in 47

h urs
Gune pg \ 160 we ht 300 grams One c b c
c t meter of culture was given sub taneously At
Ahours o minut s sight edema 4 cub c ce t meters

of s rum B was given a boutaneously Animal was de d n 23 hours. G meap g No 164, we ht 3 grams One cubic centimeter f culture was given subouta e usly At 7 s ho rs m d at e edema One cubic ce timeter

of serum B g subcutaneously Animal was de dim 3 hors
Guinea pig N 167 ght 3 g ams O e cubic centimeter of culture w giv n 3 bcuta e usly 1 7 g hours moderate edem Fou cub c timet rs of serum B w given subcutaneously Anim I was de dim at home

G mea pig No 161 weight 320 grams One cubic ce t meter of culture was given subcutaneously. At 1 ho rs m rked edema 1 cub c ce t meter of serum B was given subcutaneously. A mal wa

dead n 3 hours

Gum apg No 165 we ght 35 grams O ccub c c num t of culture was me subcuta cously At 12 hours m ked edem t cub cc nt m t f m B sg c s bcut neously fA msl was d d1 3 hours

All animals that died showed the usual pathologic picture on autopsy and all heart blood cultures yielded Bacillus septicus

The results showed that serum B had de finite prophylacite but little therapeutic value under the conditions imposed. Unfortunately it was not possible to repeat this experiment with weaker test doses which the writer be lieves would have given more favorable results or to test the therapeutic action of the other brand of serum some of which might well have given much better re ults

### EXPERIMENTS ON BACKLUS NOVAL

For these experiments my Bacillus novyi No 15107 (old No 140) was selected This culture 3 received from Dr Michel Wein

TABLE Y -- PROTECTIVE ACTION OF CAS GAN GRENE ANTITONIN B AGAINST BACILLUS NOVYI

*					
G mbe	W gh grams	Dos f	Dos 1 rum	Le	F 1 resul
7	30		-	Tp 1	D dua bours
		$\overline{}$	-	Tp al	Dad h rs
	60		_	Typ al	Dad 6 b urs
6	60	00	_	TPI	R co ed
	_			`	LI d
0.9		_		V	Lid
	,			Typ cal	D d hours‡
	∞	$\Box$	00	Typ 1	D din b prs

If bleed cul ur ga 2N cul ur m 1 from b rt blood

berg of the Pasteur Institute in Paris France in March 1921 as Bacillus oedematiens No 128 Without entering upon a discussion of the long controversy over the correct name of this organism let us say simply that we regard Bacillus novyi as the earliest valid binomial for this species (a)

Owing to the increased number of infections by Bacillus novy: encountered during the Mrican campaign (6) the inclusion of antitioxin for Bacillus novy: in polyvalent anaerobic gas gangrene serum suddenly became a matter of considerable urgency. However serum B was the only one claiming to contain antibodies for this species at the time these experiments were in progress. Two experiments were conducted with this serum.

Experiment 10 Pebruary 25 1943 a series of guinea pigs was injected with Bacillus novy1 15197 grown for 3 days in glucose broth in a constricted tube with marble seal (5) Four animals served as controls on dosage while 4 others comprised the test with serium B given simultaneously The results are shown in Table V.

Table \ shows that I cubic centimeter of this culture of Bacillus novyi killed small guinea pigs in ahout 22 hours. One hundredth cubic centimeter killed one in about 46 hours with typical pathologic changes but while oco

ture of the skin and this animal slowly recovered

On the other hand gunnea pigs receiving it cubic centimeter and o i cubic centimeter of serum simultaneously with i cubic centimeter of culture showed no symptoms at all and lived hut those receiving doses of o or cubic centimeter and o cor cubic centimeter and o cor cubic centimeter died about the same time as the controls. Cultures were made from the heart's blood of 4 of the animals that died hut all were negative.

# PROPHYLACTIC AND THERAPEUTIC ACTION OF SERUA B AGAINST BACILLUS NOVYI

Experiment 11 March 5 1943 a series of 11 guinea pigs was injected subcutaneously during a period 6 13 minutes with Bacillus novy1 15197 grown for 48 hours in glucose broth in a constricted tube with marble seal (c)

Three animals served as controls on dosage 2 as prophylactic controls on the serum. The details of treatment with serum B and the results are shown in the following protocol

### Cot Is o Do ge

G 1 eap No 4 weight 5 5 grams ubc c nt met r f cultu e was giv n uheuta ou ty At 24 h rs the e was mode ate dema A imal s dead n 7 hours

Gune pg No 98 we ght 45 grams oo che ce t meter of culture was giv n uhcutant u ly At 4 h rs m de at edema was noted A im I wa dead n 48 h urs

Gune pg N 176 w ght 43 gr ms 0 00 cuh ce t met rof cultu e was g ven s h ut neously At 4 48 and 7 h urs sl bt d ma wa noted A 1 malr over d

### C t l on Se um

Gui ea pig A t ght 2 gram cub c c at m te of cult e plus ooi cub c c at m te of serum was g bc tane u ly n res lts L v d Gu ea p g A 91 we ght 370 grams cub c centimete of cultu pl oooi cub c ce t m t r f erum we g e subcuta c usly n r sult Lived

#### Tets nTh opileAt of Sim

Guneapgh 186 weght 36 gram ubt centum t of cultu as gvo ubt ut o sly At hours n symptoms cube centum te Is rum wagen sube t ly t, thus maked ed mat 48 hos ed m sh d g at 7 hur d maalm tg e obeak sha at 61 y completivrece ced L d

Gu ca pig N 04 vei ht 35 grams 0 1 \
centimete i cultur was gv n subcutance 5 \
4 hours light edoma ubc cintuer f teras gven s beutaneously at 24 hours modin
cdema at 48 hours edema subsading at 66 hour
ed ma almost g n at 6 days completely ittore 1
Lied

Gui cap g No 19 we ght 33 grams ooted cent meter of cultu as given subcutan ouly it 6 h us a light eterms 1 cub centimete of stem was giv n subcut cou ly at 24 and 48 h r mo atcedema at 72 h urs and 60 hours 5 vere d at 12 b b 18 found dad (pneumon a) D el at 12 b b 18 found dad (pneumon a) D el

G meapg No 189 we ht 31 g am o cub c numeter of cultur as gt en s beutan ously it 8 h urs sl ht edema cubic c numet of s n was giv n ubcutaneously t 4 h 18 and 48 h ur mode at e clema at 12 hour s clemas b bin t gof h urs completely ecover d Li ed

G mean g ho os we ght sos grams che cent meter I ultur w se pron subenta couly the 24 hours moderate edema r cube ce tmeter 4 ta hours moderate edema r cube ce tmeter 4 ta hours moderate edema r cube ce tmeter 4 hours et e edema o zing ato 6 hou s ze ere dom la very red at r d y, aden the ech r i c ta f by 3 continuet with co s derable adjust te the by 3 continuet with co s derable adjust te the y seen at the company of th

Gun a pig No 99 w hht 300 grams e culv at centimeter of c it re was gi en subc t neou! v at 24 hou s moder teed ma at 27 h urs e e d mt cubic ce t m te of erum w s gi n s bc ts usly at 24 day complet ly ecov ed L ed

All animals that died were examined post mortem. The characteristic moderate to marked subcutaneous edema was observed in each instance. There was some blood tinged feliuson but little or no true congestion and no emphysema or lysis. The lungs were paleer cept in the case of guinea pig No 150 which showed a moderate congestion of all lobes in dicating pneumonia. There were no other gooss changes in the viscera. Heart blood cut tures were made in each case but all were not stress the contract of the contraction.

This experiment showed that gas gangree serum B had considerable therapeutic action in guinea pigs inoculated with a small but fails dose of Bacillus novy: if used within 4 hours

# EXPERIMENTS ON BACILLUS HISTOLYTICUS

Serum B wa the only one that claimed to have antibodic for Bacillus hi tolyticus The culture selected for the following tests was

ABLE \I -- PROTECTIVE ACTION OF GAS GAN
GRENE ANTITO\IN B AGAINST BACILLUS
HISTOLYTICUS

111	210	L1	ticus			
jua be	"	ь	Dose f	Dos f serum	L	1- 1 sult
3	H				T) 1	De d h rs
	T			-	T p 1	I d
	(-	_	<del></del>		$\overline{}$	L d
	t	_		<u> </u>	52 h ed m	L d
	T				Typ cal	D I
9	T	ge	-		T cal	1 d 6 hours

so 12,97 which was isolated in Au<sub>s</sub>ust 1940 mm a culture submitted by Captaun D M suhns from a fatal ca e of gaseous gangrene it Letterman Ceneral Hoopital San Francisco Laliforms The orl<sub>2</sub> mal culture was contamnated by Bacillus porogenes and Micrococ uses endermals.

Experiment 1 December 9 194 a series of gumea pigs was injected subcutaneously with a pure culture of Bacillus histoly trus No 1 509 grown for 24 hours in a glucose meat both medium. Two of these animal served as controls while 4 received all o varying amounts of serium B simultaneously as shown in Table VI.

Table XI shows that serum B protected a guinea pig against at least so fatal doses of Bacillus histoly ticus culture which was moculated subcutaneously. The marginal animal showed a sli ht transient edema but there is a no liss.

Although guinea pi<sub>s</sub>s inoculated with Bac ullus in tolyticus subculaneously generally show a strikin, and peculiar denudation of skin at the site of inoculation, they usually do not die. But both guinea pigs used as controls in the retw. riment did so

Control of which received I cubic centime ter of culture showed at 15 hours an area 3 centimeters across completely denuded of skm and was obviously sick. It died at 16 hours at which time an area, by 11 centimeters was denuded but there was no perforation of the peritoneum and all of the viscera was normal in appearance V culture from the heart s blood was sterile

TABLE XII —PROTECTIVE ACTION OF GAS GAN
GRENE ANTITONIN B AGAINST BACILLUS
SOPRELLII

JORDINE														
G P E	# F	Dos f	Dose f	Le	F tre t									
	- 00		-	Tops !	D d is									
6	5		-	Typ 1	1 d									
3	6	1	-	Tp 1	D i									
	éoo	00	-	Tpl	D d									
3	5			1 h s	L i									

Control 103 which received o 1 cubic centimeter also showed at 15 hours an area about 3 centimeters across denuded of shin but this animal was apparently not sick. However at 40 hours it was found dead with an abdom inal perforation and its intestines hanging out which is common in animal receiving in tramuscular injections of Bacillus histolyticus. The Bacillus histolyticus was recovered from the heart's blood.

Gumea pies Nos roi and rog both devel oped large areas (6 by 10 cm) of denudation without perforation at death cultures from the heart's blood were negative in both ca es

#### PRELIMINARY EXPERIMENTS ON BACILLUS SOPDELLII

Serum B was the only serum claiming to have antibodies for Bacillus sordellii

Experiment 13 For this experiment my strain No 1316 was selected. This strain was re exied in 1927 from Dr. Prank, L. Melenev of Presbyternan Hospital New York, as C. edematoxides. No 1 solated from patient (10). Its identity with the previou ly named Bacillus sordellu was shown both by Hum phrevs and Yleleney (8) and by Hall Jungherr and Rymer (6 7).

Five guinea pigs were inoculated ubcu taneously with a 48 hour meat broth culture as indicated in Table VII

Table \II shows that I cubic centimeter of serum B protected a large guinea pig against at least 1000 fatal doses of Bacillus sordella culture. This animal showed only a slight transient edema.

# STUDY OF THE LATE SYMPTOMS OF CASES OF IMMERSION FOOT

EVERETT G FAUSEL MD FACS Major MC AUS Holls N w Yo k nd JAMES A HEMPHILL MD C pt in MC AUS Mount Holly New J sey

UTING the early part of Tebruary 1943 there were admitted to the ho pital at this post a number of patients with immersion foot meurred as a result of the subling of the patients transport. The condition varied from mild to evere and the patients were treated in two main groups as follows. In the first goup the legs were exposed to fairly cool air unker cradles in the second group the legs were wrapped loosely in sterile cotton. Both groups were further treated by hed test

A small third group made up mainly of civilians contractors employees and men to hit marin s whose going and coming in the hip pital could not be completely controlled due to the large number of cases and general confusion undertook a type of treatment of their own namely Finish type steam bath. The e patients made a much more rapid clear into of local and general symptoms than did the group treated with bed rest and cooling it: left that this type of treatment should

have further investigation Mer the di charge to duty of the Army patients and is time went on it was noticed that a number were having persistent symp t ms ref rable to th ir lower extremities. This pursiter e of symptom was noteed first an or m as personnel in the hospital whose duti a required long periods of standing on Inquiry then showed (about 14 tleir fet m nth atter onset) that a onsiderable num her of the men who were on the sunken boat " hether they had been hospital patients at the original on et or not and who wer still no dity at the port had persistent complaints of on type or another referable to their lower extr mities

It was then determined to carry out the pre ent study of per onnel remaining at the p t at the pre ent time with the following in time

General Of the 65 persons n main :
this post in April 1944 14 months after the
sinking it was found that 40 or 75 per cent
of the total group had complaints referable to
their lower extremities and that of the
patients examined 42 had abnormal phis the
findings in their legs or feet which was findings in their legs or feet which was for
cent of the total group remainin or 85 per
cent of these pre-enting combaints.

These men were of various commitment and enlisted grades and all branches of serve in the Army. Their ages varied from oto a years with an average age of 34. Their particular occupations and p' ces of a dence in the United States were inquired into and neither was found to be a factor in the present study.

Previous medical history. A check of the previous medical history revealed nothin any of these patients, that was a factor in the prevent complaints. There were 6 old injurit to lower extremities but none of these considered a factor in the present complaint.

Experience at the time of sirking A stub manufactors in order to determine the van slactors whi h might throw some h it to the question of injury as male as the question of injury at the time of sinking and 9 were found to have received nix magures at that time none of inhish you were considered to be factors in their preservoir and the proposal strength of the proposal sinking and the proposa

All 6, men had their legs more or les in the water following the sinking either in the sea or in lifeboats partially filled with wat r or rafts partially filled with water

The legs were in the water in this manner from r to o hours with an average time of 3 4 hour. The water temperature van i from 28 to 38 degrees evidently depend on whether or not the men were in the rei to fit the table Stream.

in attempt was made to determine how these men were clothed particularly with r ference to their lower extremities in order to see how such clothing might affect their original condition and follow up results The largest group was wearing government issue clothes with ordinary government issue shoes and li ht woolen socks There were 26 in this group 4 of them had complaints and 19 showed abnormal physical findings. In the next group made up of Air Force enlisted men high leather boots and heavy woolen socks were worn There were 7 of these men all 7 had complaints and 4 showed abnormal physical findings. In another group made up men light wool socks only were worn all had abnormal complaints and physical find in a In another group of 5 men government is uc shoes only were worn and all had com plaints and abnormal physical findings The 2 men remaining did not recall what clothing they had on their lower extremitie while in the water both had complaints and abnormal physical findings

No leduction can be made as to the benefit any particular type of clothing for the lower extremities would afford under the circum

stances as they existed Of 51 men checked the effect of the cold immersion was so marked that in getting aboard the Coast Guard boats picking up survivors 38 of them needed assistance and were hanled up on the boats by ropes Only 13 were able to get into the rescuing boats un at led and it is notable that of these 13 8 were in a lifeboat with water only up to their knces for a period of 3/ hours. The rest of the men who did not need assistance were either in the sea or practically submerged on rafts for a period of 4 to 5 hours. Of this group who did not require assistance in getting aboard the rescuing boats o had symptoms at the time of examination and 7 had abnor mal physical findings. All the men who needed as I tance in getting on board the rescuing boats complained mainly of numbress or lack of co ordination in their legs so that they had difficulty in walking and the treatment on the boats consisted in the removal of wet lothes rub downs hot drinks and general warmth

Of the total group examined I were admitted to the hospital for treatment after their arrival. They had immersion foot of varying degrees and the length of treatment varied from 1 to 17 days with an average stay of 6½ days.

Subsequent treatment During the 14 month since the original onset only 1 man of the whole group was admitted to the hospital for symptoms referable to the econdary effect of immersion foot

Eleven men came to sick call of the group at varying periods during the 14 months the average number of visits to sick call being 1 to 5 and the main complaint being prins in the leg—usually treated by physiotherapy.

Present symptoms At the present time the following are the complaints presented by the group still under treatment

Burning sensation or burning, p in in the feet or legs while walking. Twenty two ner-complained of this in varying degrees. I trace number of the group had the symptom in mild form and thought nothing much about it until the complaint was chetted by question. In a very few it was a marked complaint.

Numbness of the legs. This was no of the main complaints, and exited in 7 of the group examined. It was of varying degree mainly existing at rest and particularly at might in bed in conjunction with re-t-rain

Intermittent claudication I ru, infermit tent claudication to the extent that the patient needed to stop and rest after walkin, a short distance due to cali cramps cut it in only 8 and was quite sever, in digree Of the form of intermittent claudication. Inown as forme fruite characterized by we kness of the leg muscles on walking a short di tance and requiring, stopping to rest b for going on there were found 22 complaint Of the form of intermittent claudication characterized by pain in the buttocks and leg simulating scalatica there were 4

Rest pain This was found as the most common and severe complaint of the fri me examined. It was found in 50 of the group and was characterized mainly either by cramp like muscle pains or general actin, of the lower extremities occurring at might will patient was in bed and associated with numb patient was in bed and associated with numb

### TERATOMA OF THE OVARY

ARTHUR H CURTIS M D F.A CS Chicag Ill no s

I RATOMA of the ovary otherwise I nown as teratoblistoma entry oma or solid dermoid has been of sur passing intere t to pathologists since early days. Thi has been frue not merely be cause of its rarity and becaue its derivation has remained obscure but particularly be cause a more complete understanding of these remarkable tumors may be the key which will eric to explain the nature of other rare ovarian erowth

Althou h encountered in other or ans and ti sues of the body teratoma is predominantly in ovaring tumor and it is here that it i found in most developed and characteristic form It is a ually a compact solid rapidly are ving neoplasm composed of tissues which are frequently wholly undifferentiated cor responding to various stages of fetal develop ment and revealing only isolated tendency to more completely developed organ like forma tion. The material entering into the structure of fermoids and teratoma is the same all three cerminal layers represented in both the difference he apparently in the tissue of origin and in the fact that dermoid are comprised of mature to sues whereas a teratoma consists of embryonal elements The great characteristic of teratoma is the lo sof proportion in its struc ture There i topographical confusion

Opinions differ in judgment of the malw nancy of teratoma it is a growth character ized by capacity for great proliferation not ascribable to carcinomatous or sarcomatous de-oneration but an inherent property of the cell which constitute it. Therefore it is to be re-arded as potentially malignant in all cases und estimably malignant in most instances.

The tumor is usually nodular or lobulated of en with projecting cysts of astonishin, lylar, esize for so malignant a neoplasm (due to rapid growth?) often the size of a man shead It may be pherical oxoid or of oxinan shape; a usually pedunculated as in our case of

F on th Departm f Ob et es and Gynec ! gy h rth

varied color-gray yellow red blue brown The consistency is usually soft but many; firm This feature varies not only with van ous tumors but also in the same growth er marrow soft to firmly clastic 1 apsul 11 ually present but may not be clearly defined Perforation of the capsule is frequent but by no means usual The cut surface reveal multitude of variations. It is polymorphous polychromic Cystic spaces are of vari di m and size the contents may be clear limy of loid fatty honeycombed or poner. It is may be gray straw vellow pinheaded tlad points or homogeneous or hemorrha 1 rd brown tissue in solid lamellated brain like or marrow like mages Strand of den e floors tissue are usual. Areas ranging from large portions or or ans or viscera (rare) to minute microscopic rudiments may be found

Microscopically the picture: that of case The tissues are mostly fetal in character but not entirely and invariably so. It is character to the title of the mediately adjacent to lawless and wild are of potentially or definitely mail nant (p by

lal endothelial or arcomatous pattern One element of a teratoma may uppit growth of the other Such one sided detelement i unu ual yet it pre-ents the very limportant question as to how far appared simple tumors of the ovary may be of teratomatous or it.

It is difficult to gauge the number of these growths which have been discussed in the leature since the days of Virchow perhap of the control

Metasta-esoccur most often in the abdoma but may appear in distant parts of the bedi but may appear in distant parts of the ori ginal tumor or a more simple structure is a purely sarcomatous or car inomatous gro—th





Timfy

a bial tumor a chorroepithelioma or a malig

Teratoma 1 a tumor of childhood and early maturity mostly before the age of 33 Not more than 5 recorded cases have been found after the menopau e

The etology of teratoma remains unsolved. The growth must be denued from a cell that can produce all three embryonic layers as expressed by Askanazy, the origin must be from a toti potential cell. Only two theories of origin are prevalent that solated blastomeres (Varchand Bonnet theory) are the source of

these trigerminal growths or that they arise from primitive unfertilized ova

Our tumor was removed from a woman of 53 the mother of a healthy children. Her father and one brother died of carcinoma Three vears earlier there had been some gen ital bleeding and vaginal removal of a fibroid tumor and polyps no mali, nancy was found the time of our examination the patient complianced of vaginal burning without discharge and a tumorous wellar generated the abdomen. There were no symptoms or evidences of endoctine abnormality.

At operation February 6 1045 the liver was firmly and inseparably adherent to the un terior abdominal wall the pancreas was in durated the upper abdomen otherwie negative. There were some adhesions about the ecum. The left ovary was converted into a freely movable pedurculated irregularly nod ular massive tumor with a smoothly lobulated external surface. The rith ovary was atto

phic The generous sized uterus contained one small interstitual myoma and one bean sized sessile polyp the endometrium was rather thick for an elderly woman

The irregularly nodular smoothly lobu lated 14 by 0 by 6 centimeter tumor represented the left ovary (Fig. 1). The outline was roughly triangular in shape one surface strand demarcating the mass into a major giant kidney sized and a minor asymmetrical orange sized smaller lobe. Some of the lobules projected from the surface as firm nodules up to 4 centimeters in diameter. The entiresurface was firm everyt over one tenth of its area which was cystic. The color of the fresh specimen varied from blush to reddish gray.

On bisection the surface presented a solid apparently maliemant tumor with numerou cystic cavities up to 3 centimeters in diameter variously filled with clear turbid slimy colloid or hemorrhagic fluid and a varied amount of necrotic debri. Some of the solid cut surface was fibrotic and firm but the major por tion was of the consistency of a parenchyma tous organ such as the liver or kidney the color greatly varied from pink to gray brown a kidney brown color predominant. Many pinhead to pinpoint black, spots were visible Trabeculations of the stroma were clearly evident.

The meroscopic picture verifies Askanazy s emphasis that often the constituents cannot be di tinguished as was evidenced by the long confusing di cussion of the distinguished pathologists during the conference at which he



presided No portions of or any such as are sometimes illustrated are present in our speci men thus evidencing the embryonal nature of this growth. It is a true blastoma. A variety of cellular structure is evident in amazing de tail and with great clarity in contrast with all illustrations which have been available to me in the literature. Organoid forms are suggested but surely not to be undeniably identified as such In Figure a are tubules resembling glands along the intestinal tract Figure c presents enithelial configurations of medullary tube like structures. Figure e reyeals a mesonephroid type of tubule not un like those of arrhenoblastoma Macche 1 lands of epithelial cells uch as in Figure 2 b but often of much greater size dominate the field in the majority of microscopic sections Masses of immature cells such as those in 11.

ure d and extensive wildly grown sarcoma like and carcinoma like areas in abundance appear under the microscope adjacent to well differentiated 1 land of cells such as those of Figure b

The more one studies the polymorphous microscopic picture presented by this tumor the greater the temptation to join the ranks of those who ascribe a teratomatous or in the many rare kind of tumors of the ovary. The statement does not gainsay, the evident original Breiner tumor and some pseudomutor cystadenomata from the peritoneal epithelium of the uterine adners.

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# ONE STAGE OPEN RESECTION OF LESIONS OF THE LEFT COLON WITHOUT COMPLEMENTARY COLOSTOMY

KARL A MFYER MD FACS ALFRED SHERIDAN MD a d

OLON resection has gone through a process of evolution that will prove to be nothin, short of remarkable lor the half century in which it has been performed The earlie t procedures consisted of primary anatomosis of the open colon with such di astrous mortality from peritonitis that the contribution of Mikulicz (12 13) in 1903 was widely accepted as the procedure of choic when he reported a 166 per cent mor tality for 24 patients operated upon by the principle of exteriorization Mil ulicz was not the originator of this plan of resection but his relatively large serie of cases was so convinc ing that the procedure has been identified with his name The Rankin obstructive resection (1930) was an improvement but even at that time Rankin recognized the desirability of a primary resection but deterred because he did not think it could be done safely

not think it could be done sairly. The next phase in this development was the performance of one stage ileocolestomes with resection of lesions of the ribet half of the colon. Yew surgeons doubted the safety of this plan as evidenced by Allen is recommendation of a transverse ileocolostomy preceding resection of the right colon (if 2) the use by Whipp ple (20 21) of the Valler Abbott tube as complementary decompression and the isolated position of Lahey in insisting upon exteriorization procedures for ileocolostorate. By and large this procedure as a one stage operation has been so success ful in the hands of so many surgeons that little ary imment can now be

raised as to its safety

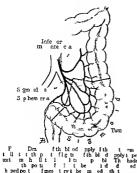
The next development consisted of primary resection and anastomosis of a colonic lesion with a conspleme sury app not ostomy ceed tomy (10) or colestomy as recommended by

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Wilkse Allen (1) Whipple (0) Cheever Dixon (6) Stone and McLanahan and White In the hands of those insisting upon this auxiliary vent the mortality rate decreased one half or more when this feature was added Dixon (5) must be credited with the exten ion of this procedure to lesions of the pelvic color but always concluded his operation with a transverse colostomy which was closed 3 to 6 weeks later.

The most recent development has been in the execution of a one stage resection and anas tomosis without the proximal vent. Cheever and Stone and McLanahan were discouraged by the higher mortality rate attendant upon this method but Campbell did not find that the creation of the external vent was essential In what perhaps represents the most thorough presentation of the subject to date Wangen steen (19) reported favorably upon 61 patients operated upon by this plan with an overall mortality of 16 per cent although 1 patient was given a proximal appendicostomy 2 had cecostomies and 6 came to operation with pre vious colostomies performed for relea e of obstruction Wangensteen bowever makes an issue of the importance of a closed method of anastomosis using a clamp technique and theoretically attaining asepsis

We should like to give a preliminary report of our first 20 operations from the private sur gical service of one of us (KAM) per formed during the past 2 years using an open method of anastomosis Though the period of observation is short and the series of cases limited we believe that the trend has been clearly indicated We were en couraged to attempt this plan of treatment by th availability of such modern adjuncts to bowel surgery as succinyl ulfathiazole multi ple blood transfusions fluid and electrolyte balance parenteral sulfonamides spinal anes thesia oxygen inhalation intestinal decom



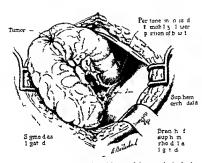
pression and the use of the interrupted permanent sutures. We have thu witnessed a phenomenon in which the cycle of development returns to its very start but the improvements which have occurred in the interim have turned have occurred upon the success.

#### CLINICAL DATA

Age and sex. The 20 cases were evenly duy ded as to sex and the range was from 30 to 7 year with an average of 64 years. Age or sex did not influence our preoperative or pot toperative management althout the only 2 instances in which we used an inhalant anes thetic were nervous females who insisted upon being unconsciou. The occurrence of atelectasis—embolism and edema was seen postoperatively only in patients past 70 years of age of whom there were 4. Metastases of the primary lesion were seen more frequently.

struction and succinylbulfathiazole therany was omitted \one of our patients in this group presented the pictur of colon ob true tion for obviou ly they were not candidates for the type of surgery contemplated here The procto copic examination became even more important here for the recognition of the di tance between the pectinate line of the rec tum and the lower limit of the lesion is of im portance in the deci ion as to whether the patient will be best treated by an abdomine perineal resection or a procedure which will preserve the rectal sphincter Wan ensteen (10) has shown that lesions 13 centimeters above the pectinate line are resected and anas tomosed with much greater ease but does not hesitate to do an ampullary resection for a lesion within 10 centimeters of the pectinate line Dixon (5) on the other hand has not re ported resections below the level of the ricto

Succentisulfathia ole This drug was admin 1 tered to all but 2 patients for a period of 7 to 14 days before surgery in doses varying from 12 to 18 grams per day The usual routine for admini tration of the drug was for the pati nt to take the drug at home in the prescribed dose after cathars: cleansing and low residue diet and to continue until entrance to the hos pital At this time an enema and castor oil (1 ounce) were repeated and the dru con tinued until the time of the operation \o further enemas were admini tered especially during the 24 hours immediately preceding operation When the latter precaution 1 not taken an occasional patient will show enema fluid proximal to the lesion which can be a source of peritoneal soilage in an open anas



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tive days. The 2 patients who inadvertently did not receive succinylsulfathiazole were those with incorrect diagnoses in sections were purformed successfully in both of these with outcomplications.

Blood transfusions The average amount of blood transfused in this group of patients was 1 350 cubic centimeters and varied from 500 to 1 500 cubic centimeters. Since we were deal ing with private patients, the need for massive transfu ions was probably not as great as we have seen in patients from our charity wards who enter the hospital in a later stage of the disease are more apt to show anemia and pre sent a more profound nutritional problem When more than one transfusion was neces sary we preferred to give it one or more days preoperatively so that its effects would be come more manifest. Although no amino acids were need in the group of patients we have already reported its use in other cases and are well aware of its potentialities (11)

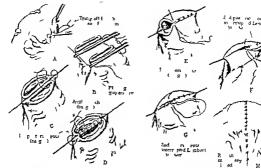
Operati e procedure. In 18 of the opatients pinal anesthesia was used in 2 of the 18 pon tocaine was used in the remainder a 1 1500

solution of supercaine with the technique of Hand and Sise. In 2 patients in which an in halant was deemed advisable combinations of ether and ethylene and ether with cyclopropane were used. Our only death was in the patient receiving ether and ethylene.

The duration of the operation varied from 1 hour and 10 minutes to 2 hours and 40 minutes with an average of 1 hour and 45 minutes

The details of the operative technique are shown in Figures 1 to 4. It should be men tioned that no crushing clamps were used in terrupted catgut sutures were used through all layers and interrupted No 35 stanless steel wire sutures were placed as a second seromuscular layer. The latter were used as Lembert sutures. Sulfanilamide crystals in quantities up to 5 grams were spinished be tween the first and second rows of sutures and about the anastomosis itself. At the conclusion of the operation the rectal sphincter was dilated and a rectal tube was inserted to a point below the level of resection.

Pathology The size of the lesions varied from involvement of a 1 5 centimeter segment



the substitute of the substitu

of bowel wall to a 14 centimeter segment. The igmoid colon was the site of the lesion in 11 cases the transver e colon and solenic flexure in I case each the de cendur colon in 4 and the rectum in 3 The lowest lying lesion in the eries was , to 6 centimeters up from the ano rectal juncture and the le son histologically proved to be a lipoma Lighteen of the lesions were adenocar inomas either papillars mu cord or annular in type. One case was that of a stercorous ulcer due to an impacted fecalith and the remainm one was the aforementioned lipoma. In a patients the regional mesenteric lymph nodes contained metasta es while in another 5 ca es the enlarged nodes proved to be inflammatory in nature Omental nodes were present in patient liver meta tases in an other and ovary metastase in another

For ETD it the first of the fir

Postoperati e course All nationts vert placedafter operation on continuous siphona c parenteral fluid were administered in quanti ties necessary to maintain fluid balance and good urme output and hyperventilation was obtained with mixtures of oxygen and carbon dioxide Although peak rectal temperatures to sos degrees Fahrenheit were seen occasi n ally these were the exceptions. In most pa tients a remarkably afebrile course va characters tic after the second or third pest operative day Gastric suction vas di cen tinued as soon as the patient first passed flatus which was usually on the 3rd or 4th postoperative day Oral feedin was usually started on the same day. In b patients the first formed stool was passed on the 3d post operative day in 1 on the 4th in 5 on the 5th

in another 5 on the 6th in 2 on the 7th and in the remaining patient on the 1oth postopera tive day. The early return of bowel function was unassociated with diarrive or bleeding except in 1 patient who later proved to have a non pecific ulcerative colitis. When there was a delay in bowel function without evidence of organic obstruction patients were given protramine in repeated doses.

The period of postoperative hospital stay averaged 13 days and ordinarily ranged be tween to and 15 days. The patient who had the ulcerative colitis remained in the ho pital

49 days

Complications: Pulmonary attelectasis occurred in 2 patients pulmonary edema in a and pulmonary embolism in i all of the e-patients were in operations of age or older. I wound infection which required readmission for drain a e-occurred in a patient followed repeated catheterization. In a anonspecific ulcerative collists became apparent during the postoperative course. There was a death (the case of embolism) which occurred on the third postoperative day giving amortality of 5 per cent. I

#### DISCUSSION

Orthodox teaching had heretofore con demned any attempt to resect anastomose and return the colon to the peritoneal cavity on the following ground

- 1 The blood supply of the colon is too poor to depend upon satisfactory healing 1e a leak at the anastomosis is far more imminent than in an anatomosis higher in the gastroin testinal tract
- 2 The high bacterial flora of the colon could not be adequately controlled by enemas alone and peritoritis and wound infection were con idered inevitable sequelae
- 3 Postoperative di tention would jeopar dize healing at the uture line by increasing intraluminal tension

intraluminal tension

With the advent of modern preoperative and postoperative care this concept requires

Retter anatomical appreciation of the blood supply of the colon has taught us that a pri

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mary anastomosi can be done if we stay with in the boundary of the marginal branches of the left colonic sigmoidal and superior hemor rhoidal arteries as the case requires 1e if care is shown in the ligation of vessel so that only the branches to be resected with the spec imen are ligated and the mesentery is left intact to within a centimeter of the line of re section Dixon (5) has pointed out that the middle and inferior hemorrhoidal arteries supply the pelvic colon so freely that branches of the superior hemorrhoidal arteries or even the terminal branches of the sigmoidal arteries can be ligated without fear of necro is of an anastomosi of the colon beneath the brim of the true pelvis. He has also pointed out that a freer anastomosis occurs between the superior middle and inferior hemorrhoidal arteries than is commonly appreciated Singleton in pointing out several anatomical principles in surgery of the colon has emphasized freeing a minimum amount of mesentery removing more of the antime enteric border of the bowel than of the mesenteric side and utilizing the appendices epiploicae when possible When it is necessary to remove the epiploic fat Single ton cautions one not to ligate the artery enter ing the bowel at that point

Many of us have gone through more than one era of new instruments and one wonders whether a crushing instrument does not have less place in primary surgery of the colon than elsewhere in the gastrointestinal tract. What ever advantage may be gained by the so called aseptic anastomosis or closed tech nique is paid for at the price of crushed bowel edges which the colon will tolerate much more poorly than will the stomach or small bowel We feel that peritonitis due to soiling at the time of anastomosis is no longer a major threat to bowel surgery with the protection afforded by the sulfonamides and still newer chemotherapeutic drugs which promise to attack even the gram negative bacilli As Coller has pointed out the more serious form of peritonitis occurs from a continuous leak of intestinal content through a faulty anastomo sis and not from soilage at the time of resec tion Our attitude is that a crushing clamp predisposes to necrosis which may slough many days later

The single most important contribution that encouraged us in the plan of therapy i the availability of success I ulfatheards arms though we went ahead with a primary resection in patients who madvertently did not receive any of the drug preoperatively only does the drug effectively reduce the cole form count of the stool (14) but its effect upon stool size and con I tency is a favorable one The combination of succinal ulfathiazole in the colon and sulfanilamide in the peritoneum was unassociated with a single instance of pertoniti and only one of wound infection. This would appear to be significant. Some improve ment in the chairel administration of the drug 1 now this such as giving the nationt a 2 . ram tablet instead of the o gram tablet Sulfa thalidin (phthaly sulfathiazole) which is be hever to be just as effective as succinvisulta thiazole requires one half the dose of the latter and offers ome advantage. We have di pen ed with the initial admini tration of the a hour dosage and feel that the lower at tainment of the desired level | less ant to pro duce diarrhea Instead of calculating the dose on the ba is of 4 gram per kilogram of body weight we have arbitrarily ordered the drug in doses of 1 1 and 18 grams per day depending upon the body wer ht In the ma tority of the cases we did not resume suc cinx ulfathiazole postoperatively for all of our natients were routinely treated with Le vine tube pastric suction siphonage after on Sodium sulfadiazine was given eration intravenously in , gram doses on the first and second postoperative days as a routine

The importance of blood transfusions can not be overemphasized. In addition to restor ing or increa ing the circulating volume correcting an anemia that might be masked by dehydration elevating the circulatin plasma proteins preventing shock sparing to ue pro t for use elsewhere and contributing mans factors concerned in the body's resi tance to infection it offers one more as vet unexplored With the in reased number of po sibility erythrocytes there i an increased oxigen ca pa its of the blood which should aid in main tampo the viability of a ti sue the blood supply of which i limited Adequate blood transfu ion by in reasing the protein content

of the body favorably affect wound healing gastrointestinal motility eduma of the anastromotic stoma and obviate pulmonary complications. Time is nece sary for the achievement of all these benefits and therefore transfusions should be given over a period of several days prior to operation. The inference of hock, and its transitory nature (when it does occur) is trikin in the nations of the properties of t

Unless there is obstruction prior to opera tion in which event the nationt i certainly not a condudate for primary resection post operative distention can be prevented with a well functioning intragastric tube. We have learned from Wan envicen (18) that So recent or more of intestinal gas 1, smallowed at mospheric air and evacuation of the air be fore it can enter the small and lar a bowl becomes an effective therapeutic plan. Al thou h the pa sa e of a Miller Abbott tube might offer theoretical advantage in having the decompression clo er to the site of ana to mosts and in atilizing the remainder of the Lastromiestinal tract proximal to the suction holes for absorption of fluids and calories the passage of this tube requires con iderable effort and technical skill o that it i usually reserved for the ob tructed patient. Further more experience has shown us that il ocecal phincier not infrequently resists entrance of the balloon of the Viller Abbott tube and it actual progression to the left half of the colon I arrested The passage of the I evine tube which we prefer should be carried out before operation so that the a piration of any s al lowed inhalant anesthetics if a general anes thetic is required will eliminate an ther cause of po-toperative distention. Such a tube may prevent an a piration on umonia which can follow any anesthetic. The practice of preventing increased intracolonic pressures by pa ing a rectal tube proximal to the ana to most (10)1 not carried out without trauma and should be done with caution. We have aide i decompression by dilating the rectal sphincter by digital means and in erting a rectal tube but not to the level of the suture line

The use of interrupted sutures has an un ler standable advantage. With the use of such u tures too much faith is not placed upon a sm le strand and the circumference of the lu men is not encroached upon Use of fine stamless steel wire as an interrupted sero muscular suture avoids the capillary attrac tion of exudate through strands of catgut or silk and therefore is less apt to create a sinus through which infection might drain. A permanent suture is a safeguard against a delayed separation when catgut begins to weaken and dissolve The use of a Lembert suture has given us very satisfactory inversion with out creation of a diaphragm which is more apt to follow the use of a thick row of several su tures Similarly the use of interrupted steel wire in the closure of the wound (8) not only lowers the incidence of wound infection, but permits these patients to get out of bed earlier and thus tends to avoid the pulmonary complications that go along with prolonged bed rest The closure of the resected mesentery with fine sutures which avoid inclusion of important blood vessels is still another impor tant detail

Our preference for spinal anesthesia is based upon excellent relaxation a quescent gastro intestinal tract and reduced likelihood foreme as or tracheal aspiration after operation. The duration of anesthesia provided hy nupercame (?):1,00 or pontocaine has always been adequate. We have given general anesthetics

only on the insistence of the patient Thus far we have discussed only why pri mary resection and anastomosis of the left half of the colon could be performed as safely without a proximal vent or safety valve as with it we have said nothing of its ad an tages of which there are many Tirst and foremost a more radical resection is possible for more di section can be done for the pur pose of removal and less for the purpose of developing a proximal and distal loop for the exteriorized segment Implants at the site of a former obstructive resection have not been un usual and one wonders if this recurrence could not have been avoided if the segment had been resected instead of placed as a septal pur

Second extenorization operations show a h h medence of complications among which are retraction of either or both loops wound infection hermation prolapse feed fistula obstruction and stricture formation. All of these add to an overall mortality and mor

Third a temporary colostomy should be avoided if there is an alternate procedure that guarantees as low a mortality and as success ful a result. Our mortality of 5 per cent is a ceptably low especially since pulmonary embolism takes its toll in spite of our best preventive efforts. If the mortality of subsequent closure of a colostomy is added to that of the initial procedure the comparison will favor the procedure we have recommended.

The fourth point is that of conomy An average 13 day postoperative course is possibly a new low for this type of procedure Avoidance of further return visits to hospital for closure of colostomes or correction of complications has considerable practical ment

In spite of the many advantages there are contraindications for this procedure Ohvi ously a patient with a distended colon due to obstruction 1 not a candidate for any type of resection and only a preliminary decompres sion colostomy should be done Earlier diag nosis of lesions of the left half of the colon which are more prone to produce obstruction than in the right half of the colon and are with in the reach of the proctoscope and sigmoid scope in the majority of instances will spare more patients this complication If the lesion has perforated and produced a fistula ah scess or peritonitis a one stage resection would be ill advised Lesions which lie below the 10 centimeter level should be accurately appraised for size fixation and regional exten sion because of the increased technical diffi culties of an anastomosis at this level No com promise should be made with the principle of a radical removal of all lymph bearing tissue for our first consideration should always be eradication of the carcinoma and our second consideration preservation of sphincter func tion In obese patients with a short fat mes entery there may be difficulty in approxima tion of resected loops without tension

#### SUMMARY

I A preliminary report of o cases of one stage resection of the left half of the colon by an open technique is reported in which there was a mortality of 5 per cent 2 Requirements which must be sati fied before this procedure is undertaken include succinji uliathiazole adequate blood trans fusions and/or amino and therapy intragas true uction siphonave oxygen inhalation an anesthetic agent with a quietingeffect upon the gastrointestinal tract and use of fine perma nent interrupted sutures in bowel and wound

The advanta es of the one stage resection without complementary colostomy in clude (1) more radical resection of the tumor

() obviation of complications inherent in exteriorization procedures () avoidance of a colostomy and (4) shortened postoperative course and fewer re-admissions

4. This procedure should not be tried in presence of a distended colon in lesions fixed close to pectinate line of rectum in presence of infection and in a patient with a short me entery.

#### REFERE\CES

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# TRANSURETHRAL RESLCTION FOR I ROSTATIC HYPERTROPHIES OF LARGE SIZE

REED M NESBIT MD FACS An Arbo Mich g n

URING the years 1942 1943 and 1944 operations for the relief of pro static obstruction were performed upon 1150 patients by my associ ates and myself at the University of Michigan Hospital A detailed clinical analy is has been made of this entire series of cases and is being reported el ewhere Ninety six per cent of the patients were operated upon by transurethral resection while 2 per cent had perineal prostat ectomy and 2 per cent were treated by supra pubic enucleation Among the 1104 patients who had tran urethral resection 16 were found by tissue examination to have cancer of the prostate while 942 854 per cent had benin lesions and of the latter there were 1,6 who had glands of large size 1e 50 grams or more of tissue was removed at op ration and this group of cases comprises the basi for the present report

The youngest patient was 48 years old and the oldest was 88 while the average age of the entire group was 69 8 years. The amounts of the sue removed are particularized in Table I

The operating time in all of these cases was les than I hour ave in 3 or 4 instances in which the operation was concluded in 6, to 70 minutes. It has been our belief that longer operation time subjects the patient to a dis proportionate risk of shock so we have fol lowed the practice of limiting the operating tune to 1 hour and when removal of the ade nomatou mas has been manifestly made quate an early reoperation is carried out when the condition of the patient permits its safe performance Secondary resection has invari ably been well tolerated and none of the 5 pa tients who required two stage resections in thi roup of cases suffered from shock or other adverse chinical manifestations at the time of econdary resection. The average amount of grams of tissue was removed in one operation and in one case 190 grams was removed in a two stage resection

Blood loss determinations were made in 151 of the cases and are listed in Table II It is the belief of the writer that hemorrhage consti tutes one of the greatest hazards of the resec tion operation and that immediate estimation of operative blood losses should be carried out routinely and when excessive los es are observed transfusions of whole blood should be administered even though there are no object tive signs of sbock or impending shock. Forty one of the patients were given postoperative blood transfusion It has been our practice when operating upon patients who have very larg glands in whom great loss of blood is anticipated to start a transfusion of blood at the beginning of operation so that the expected loss can be simultaneously replaced Blood transfusions were admini tered during opera tion to sof the patients in this group

The smallest blood loss in this group of pattents is 3 cubic centimeters and the largest roco cubic centimeters which occurred in cases. The average blood loss was 9 cubic centimeters. Postoporative hemostasis carried out by using the resectoscope was necessary in 6 cases.

A radio tube type of generator was used in all of these cases for the production of the cut ting current and a damped current generated

TABLE I -CLINICAL DATA ON LARGE BENGN HYPERTROPHY CASES-1942-43-44

ti sue removed was 76 4 grams. În 2 ca es 160 From Th. Department. I S 8 ry. U. er. I Michigan. Medical School. A. A bo

TABLE II -OPERATIVE BLOOD LOSSES ON

ec.	Cases
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7 t 900	•
200	
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	54
Sm Ilest blood loss	
La gest blood 1 ss ( cas )	000
Av rare blood loss	30

hy a spark gap condensor was employed for hemostass. Whether the more highly damped cutting current that is produced by the Bowe generator would have resulted in smaller blood losses is not known A comparative tudy of patients operated upon with the two types of cutting current would be of great interest

cutting current would be of great interest. Further data on the 176 cases having large benign glands indicate that external urethrot only was performed for the introduction of the standard size resectoscope in 50 cases 33 5 per cent this constitutes a significantly more frequent need for external urethrotomy than in all of the resection caes in which unethrotomy was employed in 20 per cent. The greater need for external urethrotomy in the cases having large pro tat a six to be ascribed to the need for increased maneuverability of the instrument which is encountered in larger or longer prostate glands. Litholapaxy was performed in 3 cases for the removal of vestcal calcult

The period of hospitalization necessary for the treatment of prostatism constitutes one datum of interest and significance. The average preoperative hospitalization in this group of patients was a 2 days, the longest being 37 days. The average exposition of the significance of the significance of the significant period of the significant period of the significant to a compares very favorably with the average total hospitalization for the entire group of 176 cases was 16 days. This period of hospitalization compares very favorably with the average hospitalization for all pro tates whether large or small that are treated by trans unethral prostatic resection in this hop tall (1, 2, ad 3, 3). It should be pointed out in

TABLE III — COMPARATIVE CLINICAL DATA—
TRANSURETIRAL RESECTION—BENIGN LE

SIO\S-1942-43-44		
,	La ge gla da (176 ases)	All benign
Ag	ye rs	At 12
A rage	60 8	68 4
Y gest Oldest	48	5
Uidest	88	9
Hosp talizati period	Days	D ys
Preoperati - e ge	4	4.4
Pre perati —I gest Post perati e— rag	37	66
Post perat —I gest	35	38
A ge t tal hosp tal	6	

this connection that most of the patients treated in this hospital are from out of form and of necessity are kept in the hospital longer than are those patients who live in our immediate neighborhood. We usually dicharge patients on about the 10th or 12th hospital postoperative day when they live out of form whereas patients who live in our own community are usually discharged on the 3th to

7th postoperative day There were 2 deaths following operation in this series of patients, thus the mortality rate for the group was 1 1 per cent. In neither of these cases was the cause of death to be at tributed to the magnitude of operation per formed upon the patient. One of the patients was a most unfavorable risk who had been on prolon ed catheter dramage in an attempt to prepare him for some type of operation. He had besides his severe prostatism an organic brain syndrome and was completely unco operative and required the constant attention of our nursin staff. Something had to be done to relieve his obstruction and continued cathe ter dramage was impossible. We were forced to decide between suprapubic drainage and transurethral prostatic resection and because of the difficulty of managin, catheters of any type we elected to perform transurethral pro static resection. One hundred and fourteen grams of tissue was removed with a blood loss that was estimated at under 300 cubic centi meters The patient died about 2/ neeks fol lowing operation and it was felt that his death resulted not so much from his operation as from his dehilitated condition having to do with his organic brain syndrome. The other

death occurred in a patient who was suffering from uremia on admission to the hospital and who was kept on catheter dramage for a short period of time prior to operation Urethral catheter drainage seemed inadvisable in this case and a decision was made to perform trans urethral prostatic resection rather than supra pubic drainage in the belief that the resection operation would be no more shocking to the patient than would suprapuble cystotomy This operation was performed early in 1942 at a time when we were performing the resection operation in spite of an elevated blood nitro gen level and unstabilized renal function This and one other case in the second instance a patient who had a gland of small size both died of uremia in the early postoperative pe nod and the cause of death was ascribed to early operation with inadequate preparation of the patient for prostatectomy Since these two occurrences early in 1942 we have discon tinued the practice of performing primary pro static operations in the face of unstabilized suppressed renal function in the conviction that it is unsound practice

In order to compare the clinical data on the group of patients having large glands with all of the benign cases treated by transurethral resection the data have been listed in Tables III and IV It is to be noted that in only 3 in stances are there important differences in the data on the 2 groups of cases These are the average blood losses which are significantly hi her in the large gland group and are of course to be expected the performance of ex temal urethrotomy-33 5 per cent as com pared to 20 per cent and the incidence of the administration of blood transfusions 39 per cent in the large gland group as compared to 10 8 per cent for all resection cases

TABLE IV -COMPARATIVE CLINICAL DATA-(OPERATIVE) - TRANSRESECTION - BENIGN CASES-1942-43-44

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tı n TABLE \ -LATE FUNCTIONAL RESULTS

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TABLE VI

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TABLE VI -Co tn ed

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On the basis of these data it is evident that all the patients except one have had an excel lent result of operation

The present status of these patients is particularly significant when compared to the end results that were reported by Dr. Edwin Daws and myself in 1940 when we presented comparative follow up data on two consecutive series of 100 car es. One group was operated upon by Dr. Dawis and had perincal prosta tectomies while the other series was resected by the present writer—these patients had be ning glands af all sizes. In that report the data in Table V andexed

We have long been of the opmon—based upon clinical impressions rather than factual data—that the end results following adequate transurethrial resection are just as good if not better in patients who have prostates that are classified as large or very large as in those who have malter glands and the comparative clinical data afforded by the present investigation would seem to support this wew Infact the majority of our poorest results have been in cases in which the resection opera

tion has yielded less than 10 grams of tissue In order to gain additional information on the question of the relation of gland size to the quality of end result following resection the data on the patients who had 80 grams or more of tissue removed at operation have been listed along with the details of their follow up reports Table VI There were 53 such cases

The edata show conclusively that the very large provides ie glands yielding 80 to joo grams by resection have enjoyed end results following operation that are just as excellent as the results in cases that involved the removal of lesser amounts of tissue. Moreover among the 24 patients who had no or more grams of tissue removed there are but 6 who have noctura 2 to 3 times while 8 have noc turns once and 10 have none at all—surely substantial evidence to refute any contention that the quality of results following prostatic resection is adversely affected by the magnitude of the gland

The matter of sexual vigor following prostatectomy is one that should be of consider

able interest to all urologi ts since many candidates for prostatectomy enjoy sexual potency and are interested in retaining it if possible To be sure many men in this age group have for one reason or another lost a participating interest but not a few are surpri singly active sexually and the latter are often particularly anxious that this function be preserved The prological literature is remark ably free from data upon the subject of the effect of prostatectomy on sexual vigor and in general prostatectomists appear to show an indifference in the matter. Most surgeons express the belief that persistence of sexual vigor following perineal prostatectomy is most unusual while that following suprapubic enu cleation is relatively commonplace Inthepresent series of 176 cases there were o, patients who stated that they noted no change in potency following resection while 25 had less and 24 an increase in sexual vi or No replies to this question are available on the remaining cases In the postoperative follow up survey of 1040 the resection cases were interrogated regarding the matter of sexual potency Among the one hundred consecutive cases in that series there were 24 who reported an in creased sexual potency while 10 had a decrease and the remaining 66 patients observed no alteration in sexual vigor

### SUMMARY AND CONCLUSION

An evaluation of clinical data on 176 patients with large prostates treated by trans unerhal resection at the University of Michi gan Hospital discloses the fact that gland size was not a determining factor influencing the morbidity mortality or length of the pital tay

Comparison of data on this group of cases with those of all beingin cases reveal that the blood losses are greater when the large glands are re-cected and as a result that postopera tive translusions are more often required also that external urelinotomy is done more often in this group of cases 33 5 per cent than

in all resection cases 20 per cent The end results following transurethral re section in the group of cases are considered to be excellent with only one case that can be regarded as a poor result. The end results in the patients having more than 80 grams of tis sue removed were just as good as those of the other patients of this group and these facts support the uppression that has long prevailed amon, experienced resectionists that patients with hig glands enjoy just as good results following a proper resection as do patients having smaller prostates that the quality of end result following transurethral resection is determined not by the size of the prostat but rather by the adequacy of its removal

# THE MANAGEMENT OF POSTOPERATIVE CHOI EDOCHOI ITHIASIS

### Another Use for Solution G

BENJAMIN GOLDMAN BSC MD FACS JAMES JACKMAN MD E Pe ylva d RICHARD H EASTMAN AB AM PhD C mbndg M ch setts

THIS di cussion is concerned with the pecific problem of recurrent common duct stones as delineated by postop crative cholangiography with a brief review of custing methods of treatment and a rejort of 2 cases in which solution G was effective

Previous to the advent of cholangiography the early diagnosi of postoperative recurrent choledocholithiasi was not often proved un less the obstructive symptoms of colic raun dice or biliary fi tulas made reoperation im perative. Despite technical advances such as the wider acceptance of the several variations of spinal anesthesia for improved and sustained abdominal relaxation, well illuminated and transilluminated operative fields, the practice of dilatation of the sphincter of Oddi with Bockus dilators and even irrigation and air suction of the common and hepatic ducts a d layed cholangiogram provides the only as surance that stones are not left behind. There fore carefully evaluated roentgenologic study of the biliary tree 1 indicated before removal of the Kehr tube

Immediate or operative and delayed or post operative chalangography are available. The latter method is preferred because it enables the radic logit to make the examination where there is ready access to all technical facilities including those for fluoroscopy. Here injections can le made into the T tube and the me dum followed visually as it passes through the ampulia into the duod num. This is epecially important in the final cholangography.

Many type of radiopaque media have been used in outlining the biliary ducts. Bismuth paste and barium solutions vere used by the

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earlier workers in this field and more recently lipsodo happuran potassium ootde and po tassium or sodium bromide have been employed Diodrast and thorotrast have also been used eatensively. It is beyond the scope of this paper to discuss the advantages and disadvantages of the various media. Diodrast 30 per cent solution has been used routincly and with satisfactory results. Caution should be used if there is a history of allergy and suitable sensitivity testimay also be indicated

The patient is placed on the roentgeno graphic table and in the supine position bile is aspirated by means of 30 or 50 cubic centi meter syringe The ducts are then irrigated with to cubic centimeter of warmed normal saline solution Sterile technique should be employed because of the possibility of extrava sation of the solution or of the diodrast. The syringe is then filled with diodrast which has been previously heated to body temperature Injection is made (10 c c ) under roentgeno sconic guidance and spot roentgenograms made in the anteropo terior and oblique projections An additional to cubic centimeters is then injected and another film is made a Bucky diaphrasm being used. A final injection is done and the last film is made in the oblique projection. If there is any delay in the die entring the durdenum films may he made at 15 minute interval Amyl nitrite or nitroglycerin may be given in case there is undue delay in duodenal filling in order to differentiate spasm from organic obstruction

Postoperative common duct concretions de velop from small nuclei of bilart debris or may descend from the higher hepatic radicals which are not reached by probe section or irrigation. With the increasing practice of choledochostomy coupled with routine pist operative cholangiography many more of these disappointing cases are certain to con front the surgeon Best (3) I ibram Torres Best and Hicken (4) and Negri and Negri have made pointed reference to the importance of the problem and to its solution

Reported method of attack, may be roughly classified as direct and indirect. Of the latter Be t and Hicken advocate the use of dehydro choic acid and anti pasmodic drugs be mouth and irrigation of the T tibe with sterile olive oil or hipotodine. More recently Best (3) has urged the u e oil the three day bilary flush regumen before as well as after operation.

Torres reports the u e of Pibram s method

but now prefers Best a procedures

Pibram records successful results in §8 case treated with other instillations into the kilm tube. This is followed by liquid paraffin by the same route. This direct method is based on the dissolution of cholesterol by other and liquid paraffin helps to transform the stones into a soft pulp that can easily pass through the papilla of yater.

Negri and Negri after encountering certain difficulties and inconveniences of Pibrain's routine made a study of cholesterol solvents. In the studies indicated that Previa gomenol early reduces cholesterol and cholesterol pigments. In 10 100 case is reported after a pre limmary instillation of 1 cubic centimeter of Merks dory! (carbainnos) choline) followed by gomenol 10 cubic centimeter daily for

10 days The attention of one of us (B & ) was drawn to this problem by several unsatisfactory ex periences Before cholangiography was a rou tine postoperative pro edure the T tube wa removed at the end of 1 days provided after clamping no colic ensued and the bile urine and feces were of normal color. After roent enographic examination wa applied postop eratively to all choledochostomies e eral cholan lograms revealed stone in the com mon ducts Operatively these cases had been thoroughly explored air uction applied and a Bocku dilator passed into the duodenum Treatment in the beginning was irrigation of the Kehr tube and duct with sterile normal saline and later Pibram method was used

The latter was not always satt factory it walls producing a great deal of pain for the reason that ether boil at body temperature. In one patient in whom a small leak was demonstrated to have developed around the T tube the injection of evin it cubic centimeter of ether produced very obyout hock.

It is for these reasons that a search was made for ome substance which would act di rectly upon the retained calculi and r luce

them chemically

The riteria for such a substance should be (r) a liquid—one that i non toxic and readily made or easily obtainable (2) it must be about chemical reduction of chok terol and calcium salts

The work of Suby and Albruht (10) and others (1 2 3 8 0 12) with solution 6 in the solution of urmary calculi readily so ested it elf since like urmary incrustations and concertions gail bladder and common lut stonus al o contain calcium. Best and Taylor class if all stones as (1) pure cholesterol () cho lesterol pigment calcium (3) pure bilirubin (4) bilirubin calcium (3) calcium carbonate Of these bilirubin calcium (3) calcium carbonate of these bilirubin calcium (3) and theoretically solution G should be chemically effective on the greater proportion of commondly form of which we have the commonly found variety and theoretically solution G should be chemically effective on the greater proportion of commond out stones.

Before in time stude could be arrain of a patients were subjected to operation and up on postoperature cholannon and up on base retained common duct stones. Because Pibrams method of treatment failed in the first ca e it was decided to try solution 6 upon empire, grounds

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The admini tration of solution G was borne by the patients without di comfort of any kind They expressed the same opinion-a feelin, of well being after the instillation of the first 1000 cubic centimeters There was no pain A mild diarrhea occurred in Case 1 and m both the stool vere green in color

While the clinical results in the 2 reported cases were excellent in titro experiments con ducted later results were di appointing when if was found that solution G per se and in a l mixture with bile over a wide concentration range had no apparent ability to di solve bil iary calcult of cholesterol type Noted during experiments were hile flocculation and some change in appearance of cholesterol calculusus faces but no percentible weight loss

Since these experiments indicate that sale tion Gales not reduce chalesteral stones cham scalls other explanations of its mode of action

max be considered

While the pH of liver bile varies between 8 and 8 6 and \_all bladder bile between . o and 60 that of solution G is about 40 Such a olution mu ht he sufficiently irritating to the mucosa of the common duct and sphincter of Odds to activate the circular longitudinal and oblique unstriped muscular fibers found in these structures

Since solution G so clo ely re embles liquor magnesis citratis (USP) mi bt not the re sults be explained upon its cathartic action

### SUMMARY AND CONCLUSIONS

 Recurrent choledocholithiasis i di cussed from the point of view of the surgeon radiolo\_i t and chemist

A brief review of the literature referrin to ext ting method of treatment is presented

2 Two case histories are cited in which so lutton G was effective

A Explanations of the possible mode of ac tion of solution G in the common duct are sugested

### MARCH FRACTURES

WALTER SCOTT VID FACS Lie to t Com d MC USNR Hillywood Clf n

**★**ANY articles have appeared in the

literature during the past 3 years on the subject of march fractures and It is significant that the authors concerned were of the Army or the Navy Medical Corps In peacetime these fractures rarely occur but they increase rapidly in wartime especially durin that period in which the recruit goes through a basic training program which entails a great deal of drilling and marchine Becau e the les on is so often precipitated during a march-46 percent-it has been appropriately termed march fracture and even though many other names have been suggested from time to time the term cont n es to appear traditional of these nontrau matic fractures of the metatarsals Similar frac tures are being reported in other bones particu larly the tibia femur fibula os calcis and more rarely in the pelvic bones and ribs and they together with the march fracture are c mmonly e ferred to by J B Hartley's descriptive term

fat oue fractures of hone It is the author's purpose to report s me ob servations made during the treatment of 58 cases of march fracture in the period from Septembe

1944 to February 10 1945 All the patients 1 e e males who developed their trouble during some phase of the r recruit schedule at a large Naval traini center having a complement of 32 000 men

First it will be noted that the general data re corded in Table I parallel those of other authors and are therefore not considered unusual. How ever the general body type encountered may re flect a sl ght glandular imbalance inasmuch as 57 per cent were either tall or fat this finding together with the lo pulse rate-62-may signify as will be po nted out later a m ld adult hypothy rod state. In this series only the second a d third metatarsals we eaffected there be ng n n stances in which the first fourth or fith were in ol ed One case is unusual in th t the p tient developed a march fracture n the sec nd and th rd met tarsals ne following the other at an int rval f 12 weeks (Fig 1)

The paon sert coted her Thev boru i fis i of the vy D partment the lir From LS al Hospital, Shoemak Calif Calif ma ETIOLOGY

Many hypotheses have been advanced in the past t e plain this lesion and the following sum mary indicates that much uncertainty still exists as to its ori in We shall subdivide the various

causes in the following manner

Forty eight of our 58 cases were studied from the standpoint of metabolic rate. The test was made after a to 4 hour period of bed rest and the avera evas found to be minus 10 72 per cent The lowest read ng recorded as minus 32 per cent and the h hest plus 8 per cent There vere only 5 Plus readin s Tventy seven or 56 2 per cent we e minus 10 per cent or lower 15 or 3 2 per cent had readings of less than minus 15 per cent and 6 or 12 per cent were below a minus 20 per cent metabolism. It is reali el that great differences of op mon have ar sen as to what con stitutes the signs I hypothyroidism in cases not p escot ng the f ank typ cal picture of my redema or cret n sm yet it is true that in adults we are forced to accept a lovered rate of metab lism as the most significant of the physical fin lings \ le c eased rate cannot result ir m emotional is turba ces and it offers more reliable evidence of hypothyroid sm than a high re ding does f hy perthyro dism. The only assoc ated symptoms if hyp thyroidism and gland lar dysfunct on found



Fig. The pites H die methicine welsopt H hid of gibth die tatarsal hits H haled P ticali ren 1 gibth die dataf fibese die tatarsal shaft.

Fig. 4. mult figur in who nicron at fib.

in our patients were the lo cred pulse rate (ase age (2) and the fact noted ab ve that 57 p r cent were either tall or fat. There was no evidence of fatience veakness ner ousness dry skin or constitution noted. The relationship of a brothir ord state to bone metabolism in an infant is clearly known for it that dediction; has extended over a considerable span of time the chical pitter of cretinams will develop and skeletal channer especially in the appearance of o sincat in the cartillama ous center. The relationship however between hypofunction of the thy roid gland and the skeletal physiology in adult is not clarly known yet it.

### TABLE I —GENERAL FINDINGS RECORDED IN 8 CASES OF MARCH FRACTURE

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may be that lesse de rees of osteoporosis de elop if that deficiency is continued over a lon period of time as 1 the case in hyperpituitary and menotausal syndrome

### THE CLINICAL COURSE

A variable amount of time elarges between the start of recruit train n and the appearance of initial symptoms That perio i may be ir m 7 to sor days which represent the extremes found in this group. The avera e lanse of time howeve it e days and the first symptom is usually a burn ing pain which comes on a the course of a hike f s or more miles. The onset of that pain ma be acute 46 per cent or insidious 36 per cent The remaining 13 per cent could not be ascerta ne 1 A character stic hop parallels the nam a d thes symptoms in turn are followed by oft tissue swelling on the dorsum of the foot. The sever tool there cardinal vinotoms (pain limb and s ell ini,) acrease fo 7 to days hen a plateau eeached in which they rem 1 mo e r less stat 0 ary for 4 to 7 days Following this stationa ) phase impro ement be ins and if unteat d wall progress town for 12 to 1 days These 3 phases a the course of a march fracture ar b th typical and constant and they serve to d termin beforehand the len th of tre tm nt sheh sub ea enth be roused Ten raype cent of the men were admitted during the first pha e 27 r 46 pe cent during the econd phase and 21 or 37 per cent were admitted f r treatment in le in the imp oving o third stage

The stages herein described e based largely o ubject e tudines obtained f m the patients themsel es but a e not i se ir m oc so alerro f for exampl the man minim es his symptom

in order to stay out of the sick bax. One must then be guided by the physical findings which are imple localized tenderness ability to walk on the tip-toe soft ti sue swelling and the degree to which the lon extensor tendons of the toes are obscured.

### TREATMENT

While there may be differences of opinion with re pect to the et ology of march fractures there i eneral agreement in regard to the treatment which conventionally consists of a short leg plaster-of Pari cast for 3 to 5 weeks followed by a period of physical therapy and a gradual return to weight bearin which requires in additional 2 to 3 weeks makin the period ft tal disability be tween 5 and 8 weeks. Simple strapping and the use of metatarsal pads have been tried but the esults are d sappointing Lonoitud nal metal bars and transverse Thomas bars applied to the shoe have also been used with alightly better results Some have ad oeate I bed rest in recent months but as vet no ep rt n tle results of such treat m nt has been publ shed

Our routine entails the principle of bed rest for a p r od of about 5 days and the administration of desicented thyrod (USP) 1 grain three times lt ly The patients are g en bathroom (bead) pri ileges and they are furnisl ed crutches for this purpose The amount of bed st required where the fricture is complete ill ry up to o days An examination s c n lucted d ly with particul r spect to the s ft t sue s ell g and it has be n noted that the selling all d sappear grad Hy in 2 to 5 day altho h the foot v ll appea s ol len fo many eeks lue to the presence of persosteal callus at the fracture te It is important that ne diffe ent ate between these t o (n flammat ry and reparati e) types f swell n The can be done very easily by what our pa tients ha e com to call the p ch test (F1 5) By p nch n the sk n ( er the sec n l r th rd metatarsal head ) between the thumb an I index



Fgs Phtth th ftt llghdsap; dth ftt lldp ft th llghdsap; dth ftt lldp ft th lttgfht dff ttdbythmoltest

figer on both the normal and affected feet a thickening or turgidit in the subcutaneous tissue will be noted if inflammators edema is present. In most cases this test ill become negative at the end of the th-d-fourth or fifth day. Bed rest is continued for z days after the pinch test is not attree. The patient is then allowed upand retuined to full duty, a tha supply of thir orditablets suffcent to has a total of 19 days. No other treat ment is given such as strapping shoe corrections or physiotherapy.

### RESULTS

In general the results obtat ed by this method have been e ceptionally good as sho vn in Table II The immediate results are 90 per cent good in that practically all the case are symptom f ee at the conclusion f the hospital stax they are able to alk with a pain or himp and the pinch test is neval.

The intermediate results were recorded by periodic exam nations throughout the fist 2 weeks of duty. Durn the time no relapses or failures ere encountered although minor complaints were made by app urmately one half of the men. These symptoms were plus minus in claracter for example, it doesn't bother me unless I double time too muclo in thurts a little in the min may when I first get up or at little in the min may when I first get up or at little in the complaint of the first first days after I left through the first first days after I left through the first first days after I left patients. These we ce typical comments in the patients.

TABLE II -- RESULTS OBTAINED IN THE TREATMENT OF SCASES OF MARCH PRACTURE BY BED REST WITH AND WITHOUT THARDID MEDICATION

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onn words and indicate that the foot is not per fect after the per d of bed rest but in the absence if any object ve 8 as is capable of with stand no ordinary line of duty. Any extremes of e ercit a e likely to rem nd the patient of hirecent injury. The intermediate results and cate the beneficial effect of the thyroid medication for in those who received thyroid medication for in those who received thyroid there vere no complaints in 63 per cent. In the amon tho e not receive in thyr id only 4 per cent were symptom free This diffe ence tends to corrob rate our view that the systemic factor may be hypothy prodism

The final re ults were uniform trespe in e of all the a table fact rs te the use of thy old and the state of the le on on adm ss on made no apparent difference in the atteme. On the hais of severelle t and t fair re ult ut of the 6 e implete is course we may lo k to the group as the motum ce tain.

### SUMMARY

r Fifty en ht cases of march fracture a e pre sentel of hich 45 were studied I om the stand point of basil metabolic rate. The average rate as minus to 72 per cent. The e a e pulle rate was 62 and 57 per cent, i the min were e ther tall r fat.

Bed rest f r a p rod of 5 days nd (in 4 cases) the almun trati n of desicated thirrod (1 g am the e times d) fo a total of 19 days was the utine tre timent f !! ed

3 At stil described his her es to diffe e tiate inflammator from per osteal wellin. Th test is a guide in lettin, the patients up

- 4 Mild nondisablin symptoms we e complained of in half of the patients thus treated (these symptoms lasted it m to 14 days)
- 5 Those who re eived thy rold showed better intermed ate results than tho e who were treated by bed rest alone 6 The final results were excellent except for

6 The final results were excellent except for that group has n complete fractures

### CONCLUSIONS

It is prob ble that a mild hij other I state in be a predipsoning sistence cause; a patients who develop march factures. Cast treatment non necessary no is in indicated every possible in the cast is no kinch the fracture hine is complete. Bed rest continued throw I het per od in hich the inflammation swellin disappear all continued for day the earlier is the treatment of choice. The administration of they do set to be a hort period is apparently help!

### FLUORESCEIN-ITS USE IN DETERMINING THE VIABILITY

### OF STRANGULATED INTESTINE

## C ALEXANDER HATFIELD M D ROBERT A BUYERS M D d ADOLPH A WALKLING M D FACS Ph I d leb P est es

Thay be stated that the diamesi of within ity of stan-ulated intestine has not been an exact science. As Wan enstern noted. In borderhine cases it is of ficult to be certain by any method. Owners and Smith stated in the stated

Failure to diamones prope by damaged intetine carries a high mortality. The death rate in suspected strangulation with subsequent resection of doubtful howel is three times as great as in those cases that escape resection (1). Until recent times no one has heen able to remove the doubt in doubtful cases, while the obvious ones

need little comment

The use of fluorescein is a relatively new dia nostic aid that appears to be accurate and simple Herrlin Glasser and Lan e reported as recently as 1912 the clinical use of fluorescent among other diagnostic aids in 4 cases of hernia and I of strangulated omentum. We wish to present 5 cases in whi h fluorescein was used at the Penn sylvania Hospital with satisfactory results. Its use clinched the diagnosis as well as furnished cons derable information. It is a worth while method of determining whether or not bowel is still viable. If there is a reasonable doubt about the viability of a segment of bowel whose remoral would reopardize a pat ent's life the fluorescein method of evaluation is simple safe and ac curate

Fluorescen a form of esorcinophthalen is extremely diffusible (3) It also absorbs ult as y let rays of long, wave lengths. When these rays of 3 660 Angst in units strike fluorescen they are instantly converted into the longer his in visio of the visible spectrum. In 1931 Lan e

F m h Surgical Servi A. Th P nsyl an H pital. Read bet th Philad lph Academy i Surg ry Jan ry 8 945

and Wolhelm (4) showed that this fluorescence could be demonstrated in living tissue. All that is necessary 1 a small amount of fluorescen in the circulatin medium and the tissues glow when exposed to ultraviolet light filtered with a Wood's type of filter Chemically the dye appears mert in mammalian circulation Pharmacolo ically except for an unidentified interfere ce with the activity of novoca n and pontocaine the dve is mactive and e c eted unchan ed by the k d nev go per cent n to hours (r) The n en ration of dve in use 1 a v per cent suspension of fluores cein in 5 per cent sodium bicarbonate solution having a pH of c 7. The dosa e is 20 cubic cen timeters (1 gm ) of this suspension intravenously We have observed no untoward reaction in over co cases

Dependin on the creulat on time the subpect will be seen p dly to fluorese (so see onds) hy the time the eyes are accommodated. The degree of fi o escence depend on the type of tissue and amount of pigment present. The skin shows up quite well in normal whe persons poorly in the clored race. The mucous mem ranes and servous surfaces in both races show up

equally well

Inspection of the serosa of normal howel exposed to filtered ultray olet li ht when fluo esce n has not been injected revealed coloring that is uniform. The intestine is dark purple with a smooth velvety consistency. In marked c trast the presence of fluorescein in the bowel makes the serous surfaces under the filtered ultraviolet light glow greenish gold with release of visible 1 ht that will e en illuminate structures immediately adjacent Bowel that has been temporarily or permanently depri ed of its blood supply appears when exposed to this light an even deep velicty numble The contrast between this deep hue! area and the b illiantly glos ing greens h g lden boxel is dr matic and colorful S mila ly when c reulation eturns and lability s resto ed the gradual convers on of the dark purple el et of the doubtful areas to a glowin golden state is unmistakable and ast n shin

On the bas s of Lan e a d Boyds wo k who showed that flu rescence readly occurs where

viab lity is present (3) and that it fails to occur when irreversible change has taken place fluorescen was used in 5 cases. Each one presented a loop of small bowel so involved as to have a doubtful reversibility state

### CASE REPORTS

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In none of the 5 ca es was fluorescence vi ible in the involved loop of bowel at first inspection. After treatment for no longer than 30 minutes in any case with the usual supportive measures the bowel was seen to fluoresce in 3 patients. These loop of bo vel were diagnosed as bein, viable and were returned to their respectule abdominal cavities. No fluorescence was observed in the two obviously gamerenous loop of bo el which were resected. Microscopic sections of the bowel showed enders or sof all the coasts of the bowel wall in both cases. In one (H. R.) of the unresected cases an area of nonfluorescent bowel in the damaged loop was found to be caused by a subserved in the damaged loop rans found to be caused by a subserved in the common formula with clown bowel wall

till de 1 fabil

# demonstrable beneath the dark portion

Five cases are reported in which fluorescen has been injected intravenou ly and an ultraviolet lamp with a Wood's filter was used to determine fluorescence in damaged bowel. The presence of fluorescence was sufficient evidence of viability to permit return of these damaged loops of boxel the abdominal cavity. The absence of fluorescence was diagnostic of nonviability confirmed by microscopic section.

Postoperative course and patholo cal sect ons seem to bear out the promosis based on the fluorescen method

There seems to be adequate ev dence that the relatively simple method removes the uncertainty from a diagnosis which never has been classifed

### BUTERFACES

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# STRUMA LYMPHOMATOSA STRUMA FIBROSA AND THYROIDITIS

I A SCHILLING M D Rochest N w Yo k

THE large proportion of cases reported under the general heading of chronic thyroiditis are of a nonspecific or un known etiology. In the various sub groups of nonspecific chronic thyroiditis namely struma lymphomatosa (Hashimoto) struma fi brosa (Riedel) and the pseudogrant cell type or struma granulomatosa (De Quervain) there are no sin le pathognomonic or distinguishing fea tures The result has been a marked confusion in the literature where names have been used loosely w thout precise clinical and pathological descrip t on It is our opinion that struma lymphoma tosa is a clinicopathologic entity. Struma fibrosa and its pseudo jant cell variant are different mani festations of the thyroid a response to inflamma tion Th se two groups are considered separately only to emphasi e their essential similarities and relationships

The general subject was touched upon during the Eighteenth Century with descriptions of suppurative and nonsuppurative thyroiditis (o) Later there were distinctions drawn between in flammation of a normal thyroid and a gostrou thyroid In 1878 Kocher claimed that all inflam mation of the thyroid was of a metastatic origin In 1884 Bowlby at the Patbolo ical Society of London presented a case of infiltrating fibroma of the thyroid concluding that it was of a mal gnant and sarcomatous character De Quervain (3) in 1904 stated that nonpurulent thyroiditis was a disease sur gene is with definite clinical and pathological characteristics Redel (5 53) in 1896 1897 and 1910 described the extreme fibro sis and adjacent adhesions of the thyroid gland under the heading of E senharte Strumit s Hashi moto 11 1912 described a diffuse enlargement of the thy roid gland by lymphocy tie mfilt tion and lymphocytic hype plasia with accurate clinical and pathological descriptions. This he considered an entity and not related to Redels E enlarte Stimilis Dr Ewing in 1022 believed th t lvm phoid infiltration and hyperplasia and fibrosis of the thyroid were the early and the late states of the same disease process which he designated be nign granuloma of the thyroid Without reference

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to Ewing s opinion Williamson and Pearse (6) first in 1925 described a lymphadenoid gotter simility to the descriptions of Hast moto. Graham and McMullagh (5) in 1931 in a complete review of the literature with additions of cases of their own separated the diseases as de cribed by Hashimoto and Riedel into elinicopathological groups. This cast a shadow on Exing 8 widely accepted opinin 1910 1922 and 1928.

During the next decade there was a great deal of confusion in the hierature with supporters for and against the unitarian concept of etiology as expressed hy Ewing However the e cellent eviews of Clute et al (?) in 1935 and McChinock, and Wri bt in 1937 Joll in 1939 Har y in 1940 and McSwain and Moore in 1943 to ether with numerous authors reporting cases now support the balance heavily for clir cal and pathological distinction between struma hymphomatosa and struma fibros.

At present many cases reported as struma fibrosa are confused with the more acute and granulomatous form of chronic there ditis so beautifully described by De Quervain and Gior danengo (14) in 1016 They repo ted 8 cases of subacute and chronic thyro ditis of a nonspecific etiology They traced the various stages of acute to subacute to chron c thyroiditis. The latter is characterized by many cellular aggregates resembling foreign body cells acute and chronic in flammator, cell infiltration acinar degeneration and obliteration with marked fibrosis. This con fusion is justifiable as struma fibrosa seems to be a late state of the earlier more acute forms which may resolve or may be progressive in their pathological changes

### CASE REPORTS St ma Lympi m t

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Patients in Cases I and were operated on twice In Case 1 the microscopic sections 11

months anart are almost identical and are reproduced here In Case z the microscop c sections of the first operation 5 years previously at another hoenital were infortunately lost. The microscopic diagnosis at that time of chronic thyroiditis and cellular hyperplasia however infers that little if ans change occurred in this cland during the s year interval These cases may be added to those of Perman and Wahleren Roulet Clute et al (1) McClintock and Wri ht I ll Hellwi and Head Each of these authors reported a case in which no essential microsc pic chan e from the original p cture had occurr d over periods up to a verre Head stated that his original microscopic section revealed struma lumphomators, and the sec nd operation revealed struma fibrosa, thus c nfrm n Ewn a beliefs. However on review of his materral the e seems little a estion that the first operation on the nationt revealed a struma f bross and that there was actually no transition excent in decree of fibrosis and adhesi as

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Case 4 is a male with struma lymphomatosa and one of the few ever to be repo ted. He is also interesting in that he had one of the rare skin lesions pseudovanthoma elasticum coincidental ly This man exhibited all the cl n cal and pathol rical characteristics of struma lymphomatosa including an e-cellent response to viray. He developed marked myvedema even though only the enlarged isthmus of hi thyrod was removed Graham (26) in 1931 reported 2 males Joll re ported 3 males and Learns reported 1 case of a male with struma lymphomatosa

CASES N 94097 CS 3, Id what fm 1 h se wif as dontted f the d time th St g Mem all h ptal N mb 935 H h f mplant was fmod t deff lag m t fh thyr df 7 years and pdg wthf th t m th wthp and t dm ss th lft The the m k dasso t d dysp d dysphaga B sal m tab h rat y bef entry had bee - pe t. Past hi t ry was g ti l psych yea pri t d ptf milddpes mass: Sh hadhd rm l pregn ci coexi t t disc es

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Case 5 is an enigma She presents characteris tics that make difficult her classification Good evidence for struma lymphomatosa is her past history of diffuse enlargement of her thyroid with a low basal metabolic rate the gross appearance of the preserved specimen the microscopic ap pearance of the gland ber postoperative course of myxedema and her early menopause One sus pects the diagnosis of struma fibrosa because of her age recent acute history superimposed on a chronic enlargement rather marked pressure symptoms adhesions of the thyroid at operation and rather marked fibrosis of the gland This may be explained by a subacute nonspecific inflamma tory reaction superimposed on an already existing struma lymphomatosa With regard to Case 5 it should be noted that there was an unsuccessful attempt at a homologous type of thyro d graft in an effort to control her progressive postoperative my xedema

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Case 6 is one of the voungest cases reported of struma lymphomatosa Ioll ment ons a gul aged o years Bogart mentions a negro girl aged 14 years and Hellwig p esents a case of a 16 year old girl The question may justly be rai ed in this case as to whether this might not be an adolescent colloid so ter with focal areas of lymphoul by perplasia. The work of Summands (27) showed that 40 per cent of simple coll id go ters between the ages of 10 and 20 years revealed on microscopic section areas of lymphoid hyperplasia This fact lead one to scrutinize the diagnosis of struma lymphomatosa closely in any yery youn. adult However th relat elv lon history with recent rand enlargement the tendency to make edema moderate pressure symptom out of proportion to the size of the gland shootin pains to her ry bt ear the surgical and gro s appearance of the 1sthmus the diffuse enlar ement and the great number of lymph follicles with germinal cen ters upport the diagnosis of early struma lym phomatosa. Her response to viav further c r roborates the diagnosis

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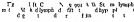
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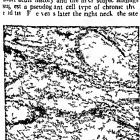
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Case 9 would certainly be considere I by many as a late case of struma fibrosa Let her relat ely short acute history and the m cr scopic findings



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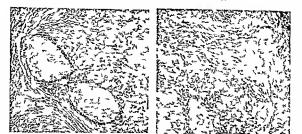


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of the ori inal invol ement was still hard in durated and nontender The condition is more typical of Riedel's struma. This fact is strong evidence that struma fibrosa is really a late stage of progress e fibrosis of a chronic thyroid tis



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Cases 10 md 11 are excellent e amples of the ps do nat cell type of chronic thy oduss de scribed by De Quervani (13 4). The latte cases is more acute than Case o At a casual lance at the microse pic sect ons the a rangement of the fibrous tissue of these cases and Cases 4 and 5 s cm smila 1 Act the two processes are ent ely dissimilar in that Cases 10 and a ret he early stages of an acute to chronic nfl minatory pocess. Cases 4 and 5 the end stage of a chr nuc degen er twe process. The fib ous tissue in st unna 1 mm maticas 1 and 5 after a win nature than that of struma fibr sa or its earlier more acute f m with this 1 shard st aight and often hyal end



F C 7 A 36 A K Stum fib Th h dhyledh t f th fib t h Thyd pthlm l t lyml

## CASE STUDY

The clin cal charts and micro copic sections of all the cases m dical and surg cal were reviewed when ever the chinical or putholog cal dia noses of acute subact to or ch inc thyroidius fib ossi limph. For cellular inhitiation or granulomatous chan eof the thyroid were mentioned stated or sug sted. This study co e ed a period of 7 year durin. In the time there were 3.750 ad missi in 50 thy od di ease. The protocol and missi in 50 thy od di ease. The protocol and mic significant of the control of



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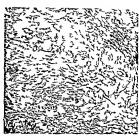
im tf sorh gu d p lm tft h lih pha th



Fg 8 Case 8 \ So 3 1 h. Strum fib osa Y ked fib os f h d h al ed h rat P et n la fib os d t m l th ck h wn A mod rat mbe I leucocytes d lymphocytes fib p le a cca nal pos down lil as ted Acnut f lymn l pp rat

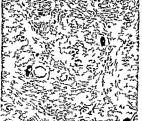
seen personally at recall except 2 In Cases 4 and 4 the patients are dead

Afte operation r postmortem e amination in many cases diagn ses of chronic thyroiditis or tib only of the thoroid were made because of a

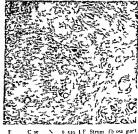


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sh ht increase in fibro s it sue of the gland or an increase in round cell throu hout the stroma There was no clinical or gross patholo caleo oboration of the ed a moses. The micro copic pic tures were probably represe tait e of the varia



F Case 9 45 CZ Struma bb oca gi t cell ana t V ked increase m bb the tran ed in h | f mod ra ha dres d byalmuzat D fl se fand focal inditrati rs i leu ocy can and I mphopes Man deg rat cms w th f rmatu f tru and pseudogian cells



F C se \ 6 340 LF Strum f boat gart II nant M ked ease hb t r ged wh L f mod ra h d ess d hyah zat D f se hitratt f I ocytes d l ruphocytes fib us pla es Few focal becesses Geg rat ac I narte wid fibre d the man the man was d t m 1 th k nm \ m per lown at fin



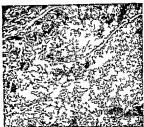
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ti ns from normal with increas ns, age Attention bere should be called to the study of Loebt and Simpson in 1938 on guinea pigs. They noted from birth a gradual increase in fibrous tissue in nam unt and density. This vas most marked about the a terioles and least around the lymphatics of the third id. Anterior pituitary, he mone stimulation was canable of lo sening the stroma.

It is of interest that microscopue sect ons f the third in a cases not rep ted here slo ed a cast identical with a true struma lymph matosa. The e sect in a e e obtained at postim tem examination of ran entirely unrelated easier. These caes are similar it he reported by Jaffe in 1938 and by Simmond (58) in 193. They also represent the err rithat can ar set fone jud es the e caes by microscope o, ext nonly

This small series was selected after reviewing and exclud in the follow; or op so cases (t) acute subscute and chron e thy this of Noo in specific et 1 or, (2) round; cell infit ation a disolerate fib os s f the rod gland with ut en the present as mytomatic and usu lh asso cat d with inte current diseases let age and deblit (3) leaf rund cell infit not it is as and lymph all yperphasia associated the imple collid, ters adenomas or true the view of the properties of the collidary of the collidar

attempt has been mad to d thou h be tween a strumius and thyroid its The f rmer s inflammation fape-exist n path l gical gland. The latter 1 if immation of a n rmal thyr d gland. Infl. mm ton file externs f the nor



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mal and pathol goal can be differentiated easily In a wide intermediate group however it is im possible to say a hether inflammation precedes r succeeds path logical change in the thyroid. Thus confusion is avoided in the search for etiological agents or conditions.

Individual features that deserved emphasis in this small series of cases p esented are discussed at the end if each protocol

### CLINICAL CHARACTERISTICS

This series is too small to draw any conclusions with regard to a specific of incal summary. However, when they are added to their respective grups reported in the literature they conform to the climical peculiarities of the disease group in question. In Table 1 the clinical characteristics of these groups are briefly summarized.

fge Acute this roud its occurs most frequently in young adults. The pseudo ant cell type of chrone city roud its an 1 strumat brosa occur in the thir la d the for ith decades of life most frequently. Strumaly mph in tosa occurs most frequently in the full than and fifth decades though there is such a wide range and overlapping that age alone s not a vell distinguishmy feature in any of the grops.

S Fights fix per cent of the 3 7,0 patients doubted to the Str n, Mem rul Hospital for thy r ld sea we elemiles. Thus the ratio of female t males it through disease a rou high to. The atto female t m le in struma floreas state!

TABLE I -CLINICAL CHARACTERISTICS

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a rou hl 3 to or 4 to 1 In strums lymphoms toss almot 1 too per cent of the patients are semales. The sew e ceptions ha e been noted pre viously in this paper. Therefore all male, with the dagmot of trum lymphomat as ma be re garded with uspic on unless the entire cl ucopatholic call picture is presented.

P to 11 it v ptoms S mptom are varied and fren overlap but in eneral the presenting symptom in struma l'mph matosa i diffuse en lar ement of the thyroid O casionally mild pres sure symptoms a e noted s ch a dispnea d s pharia h ir eness ace chan e ti htness about the neck cou h or str dor 5 ons a d symptoms of ea ly my edema ma be present. We t common of these symptom a e wei ht ain e y fattrabilt weakne dryn ss of the skin and mild my edematou face. At times tremor ne in omnia palpit tion ert o and symptom related t the s moath tic and central nervous s stem m s be p esent These are a u lls econdary to mild pres ur vmpt ms and are n t related to h perth r fr m which does not suit At best the c mplaint I pat nts with trums lymth mato-a re aque with the one ex eption te and a fullnes t the r th t the baea th nat

With strum the saith in time Pre-ure sympt in remaind others what an elect that the light properties of the same and the remaind the remainder of the saith the saith the saith the saith saith the saith sa

not ion or than 1 to vears Ca 71 an excep-

With the 12 t cell a 12nt I strum fib ve pain a era fren the chi f c mplant nd occurs n the neck r should r with r dati n t the homolater 1 ear or back of the head. In Ca 11 the chief dm ttin omplant na a that sh t t the b ck of her head as or ated with ad ffu Is enla ed thyro d These two s mpt m should I ave lead one to suspect a subjecte r chro c thyroid tis There a e fte p es ure symptoms of mild e eity as oc tel with the enlar ed land but these a e a able Operation is often undertaken ithin a fe eeks ithe n set becau e of the po ss on i p essu e sympt ms and the presenc of nenla dibe thes f the throod he hadnes uets ml

Summat in the complaints presented by these three clinicop the larged group in quest in struma i mphom tos char eten ed by a d ffu nlar ement usu Il of l n stan l n w th ague soit decomplats Strumabb sai maked pr dorr and t p s re mpt ms with ca nal condars pers s mpt ms and no tender t dm eim Th grailla ant I trum tibrosa ch a ter dit cuie panna krshlde radit te Itheh dada nied itent der giter 1 stat it Strumal mph ma theral Thi t t t sespandeall t c taitothelik freq nse t trum thosa fp∽ l tellehr eib d Tre in to s unkn n \ a theraf m lm rst b duan t testi t m lmth m nd ith tarrimi f p hab 10\1 D tale trule tmlm

TABLE II -1 ATHOLOGICAL CHARACTERISTICS

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Blood resel	i 1 d	Thk f madmd	P i fibros d mlhk		

I ostope att e con se In general vith or without operation cases with struma lymphomatosa tend to Lecome my redematous and must be supported by thyro dextract St uma f brosa and its giant cell va ant seld in cause my redema provided that en u h normal thyroid tissue has been all ved to remain after thy roidectomy. Howe e in strum? I'b os; pressure symptoms are apt to p ogress and there is often a esitual hardne s and indurat in to var I the pe phery of the lobes where resect n was incomplete nd as such these to groups a e indi tin h bl months years after operat n The g nt cell a tant of struma fibr sa may suf side sp ntaneously f left al e though its symptoms may be so announ th t operation can of be vith h ld. In c nelusion the fact that erv fe of the cases of my of the e groups ha e l d second pe at ns is ample evil nee that the lecome it nevith od to their mechanical effects. Mo er this ef feets can u tally be alleviated by one op rat n Struma lymplomatosa loe pro ress plys olo ically have er as has been noted

Lob ato Latorat ve ammatio (fers li the diagnostic and if the veception fithe bisal metablic rate which as nited in 1 m and or is hill evaited in truma for in fit grant cell variant indio in truma himph mat sa If the brail metal licrate quite l'it els bid cholestrof may be els ated. An min shi con stant feature in list in marke limic l'ma McSwan ind Moo state that there i rilie de l'mphix to in the blood means me ses of

struma lymphomatosa without elevation of the the v hite blood cell count. The Nassermann and tuberculin tests are no d fierent than ould be expected in an igroup of people and are not a constant feature in their results. Cultures and bacterial smears of the thyroid have been constantly negative.

Pathology In c as derm, the pathology of these groups one should correlate the find ags at physical examination the er ss surgical pathology or and the microscopic repot

Ply 1 I Instruma ly mphomatosa the gland s diffusely firm occasionally it is de scribed | s h rd The lar est gland described | s h rd The lar est gland described | s h GS a was 179 grams Often it is fixed to the trachea on s allo ing The glan1 | s eldom ten der It my be assymmetrical in its enlar ement but | J ll states the normal throid is often a yimm t call in its development and occasionally a | lel be s lackin. The fact can e plain the symmetrical enlar ements of Case I and the m kidly enlarged is thin this vas removed in C seq. In struma three m detay encoded in the plant cell form of chrime they did it did see enla gement occurs mab ut 70 per cent | the cases | I its localized in mab ut 70 per cent | the cases | I its localized in

ne more lobes in the remain ler. If the exam t carried ut with care first in to the ti sues. Im st d'ays in ted. The glind is nen chi ha d'enle ess a fail ve constant fea tre in the ch inci thyroid is. In n ne i these if m a beuit heard Noulles a e er rely felt and in ca ein he hithey ere il riled pe peratuel they vereab into jurge! An un presentation in the vereab into jurge! An un presentation is not in the presentation in the vereab into jurge! An un presentation is not in the presentation in the vereab into jurge! An un presentation is not in the presentation in the vereab into jurge! An un presentation is not in the presentation in the vereab into jurge! An un presentation is not in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation in the presentation in the presentation is not in the presentation in the presentation in the presentation is not in the presentation in

The is an important different al point from a malionant lesion. Remonal lymph n des are

seldom enlarged

G s ball of 1 The cross appearance of the gla id corroborates a careful physical e aminati n with regard to size shape and consistency of the cland. In struma lymph matosa the diffu e en largement may proceed a steriorly in each fash on as completely to encycle the traches. The diffuse involvement includes all prolon at ins and extensions of the gland. The surface of the gland i smooth pinkish in color with a p endol bull r or bos elated appearance. The cut surface and irs finel Johula with a vellow, h cast that is char c teristic. The eare n adjacent adhesions except a thicken n in ome instances of the n rmalls existin pretracheal attachment The lands from In Consistency at operative exposure though it may feel hard to preoperate e e am nation. The

amount of bleed n is variable t one ation In struma f br sa the gross at ne r nce is char acteristic The pland is white glistenin smoothly enlar ed extremely hard avascula except where fib ous tissue ma ntains the parulousness of a large essel and densely adherent to sur unding soft tissue and pretracheal muscles. The el od cuts with difficulty and resection is often physically impossible except by continual ship dis section without identity of adjacent structures nerves or vessels. As in Case 7 the esophagia may be completely surrounded. In no case of true struma tibrosa is this a lifes e character suc lack ne unles a lobe is uninvol ed. In 30 per cent of the ca es the process is local zed i ne or tso labes of the thyroid Frequently this fib ous en lar ement of a lobe will encap ulate and c mp ess a collo d'adenom as was true n Case ?

The ross path low fapse d and cell this od us is ensuinat to a struna thor and in ship per ones tency and e third of in of ment is cert that it for machs addes on to the sur oundin of us use and if pe ent they refer to the surfaces. Yet is expected, but they ensuind the capacity howe e a perith we but is described in operative it to the high the capacity however a perith we have the capacity of the capacity of a ration for unit time. In the capacity is described in operative in the high the capacity and and and a ration for us of the capacity of the ca

If p / l/gs In thi desc pt the sist teand appearance f the ac mare p thel um the p exence or absence of 11 d the apperance and derree of the osis in the strong of the gland the character of intificrate cells and the stat. I the blood essel warrant c reful o sid rati

Struma l'imphomatosa p se ts a dritu and

by a flatten n of the coulbelium to a year I m cub idal type ith eccentrically place I dark my eler. The acini shrink in size and become small e They have a tendency to coule ce with the firms tion of rale de cuerate cella Collou la canta e absent Rarely does one see a 1 end mint cell formed in an a louxture of remaining collision! ac nar en thelial cells. Oc asionally lependin n the level of the sect in with regard to in he this rold e icle one sees an intra ac nar cell more of description and calls and called the latench is present. One ee constantly an ocrea in fibrous connective tissue sur und no the labule of de negating ac n. The one cas in amount as the disease proces a number Often in the lite ta es one may see o molete fib ous rent cement of whole lobules II ever this for us to ne is of a finer vaving textu e that serves to d tinout hat fom the hard coarse type found in struma fibrosa. The rean ement of the fibr on te s e as umes char ctera t c finely wayin about the lobules in the late states of this di ease and is often confused ith the early appearance of the f brous tissue in the mant cell vari at of st uma fibrosa. Here however as in struma fibrosa the fibrous tissue is bard and coarse Ln doubtedly the progrent simil rity has been the cause for m ny writers to consider the ty sone di ease or cess. There is a diffu e infiltrati n of lamphocates throu hout the cland in all cell lar planes and bety een the acin. There are numerous areas of lymph follicle with thei character tie germe al centers c mpo e l of la ge lymph avtes and renculum cells with their motor of ures Plasma cell are occa i n ll scen Le cocytes t a e and f und ith difficulty if at all Lar e m nocytes are occas nally seen a ir rely ne sees a nseudomant cell hich has been described The e is no endarter to o thicken n of the m I of a te roles in st uma lymph mat a and the eas our lue vascular ty of the glan !

Strum t br sa p es nts a trik p cture 1 halmed tr ht fibous t hard den and I tile else at a c ual lanc On fu ther m spect n ne may n te c myres on if ep thelial elements f the rem in In the n of lareis usually c mpl te absence f h we e ther epith hum When pre nt in the u n I ed areas the ac n appe r fa rly n rmal w th var n ies shipes nd cll de nie i fre en thelium i us ally n rmal c bod type cent all pl ce ! ucl ! The e re ally us hr mic and ut nfl imators clls th t ha e militrated the conserver et sue planes Their mo nt depe d n the a ea look i tad the st e of the p oce In the late ta es f struma

fibrosa these infiltrating cells are less frequent Scattered lymphocytes are most frequent. There are no germinal centers or areas of hyperplasia Occasional leucocytes are seen. Plasma cells and aundern monocytes are seen in varying num bers. Occasionally, pseudog ant cells are seen though even these are very rare or absent in the late state. Which in biref shows hittle else hut through the seen that the seen of the intima and media and the vessels are surrounded by a culf of fibrosis in most instances.

The lant cell var ant of struma fibrosa presents a much wilder or ture microscopically. There is an acute degenerative process in the acinar epithel jum and often in one low power field many stages of this degeneration may be seen. Acim appear normal in un nv lved areas These stages of de gene ation vary from only hyperchromatic nuclei to a c alescence of epithelial cells with the forma tion of an intra ac nar cell ma s or a pseudomant cell As the actnar ep thelum de encrates the continuity of the wall of the vesicle becomes lost First it thins in one area then proceeds to a more complete breaking up Colloid is often left in open tissue spaces. In some areas lar e monocytes may be seen penetrating these cellular agoregates In other are s where no colloid is present and no acınar epithelium can be distinguished these pseudogiant cells are indistinguishable f om true foreim hody cells of the Langhans type In fact ultimately these cell lar aggregates that include acınar epithelium monocytes and colloid may he true foreign body cells. This could result from absorption of the colloid and degenerate epithelial cells by the accompanying monocytes This con clu ion is borne out by the fact that in the late stages these giant cells have fewer nuclei than the earlier agoregates of cells. There is a marked in crease in fibrous tissue that is hard coarse and often hyalın zed though to a lesser degree than in struma fibrosa It is arran ed in characteristic lobular whorls and is to be dist nouished from the latef brosis of strumaly mphomatosa as mentioned

Interspe sed are numerous lymphocytes and plasma cells Occasional cosmophils can be seen in areas numerous leucocytes are present and focal necrosists suggested. A bacter a spores or micro-organisms of any sort are seen that might implicate some specific etiolo.

The small arteries and precapillary arte oles uniformly show thickening of the int ma and media particularly if a siber tissue stain is used. This fact is very beautif lly demonstrated by German using the Hortega si lver gold impregnation technique. It is also emphasised by De Courcy (tr. 12)

Thus in these three clinicopytholo ical groups irrespective of their relationships certain patholo ical characteristics are present. In struma lymphomatosa diffuse enlargement of the thyromethod with dense lymphocytic indilitation and hyper plasia associated with degenerate actin may be seen. In strumin fibrosa there are the dense peri thyroid adhesions and diffuse fibrosis. In the giant cell, variant of strumin fibrosa die notes par ticularly, the presence of cellular aggrevates resemblin fore gia body giant cells with acute degeneration of the acuti giving the gland a granu lomatous appearance.

Pathogenesis and etiology Little has been con cluded about the relation hip and etiology of these di eases With regard to the relationship of struma lymphomatosa and struma fibrosa there are three trends of thought First they are the early and late man festations of the same disease process (Ewing Heyd Coller) Second they are different manifestations of the same process (Eisen 17 Womack) Third they are separate and distinct pathological groups (Hashimoto 30 Graham 25 26 27 McClintock and Wright Clute et al Harry Lee Joll Hellwig McSwain and Moore) Throughout this paper emphasis has been placed on the latter view so that a restatement of their differences is unwarranted Let to consider the two entities one must have a concept of different etiologies

Therefore the relationship of the so called pseudogant cell thy roditis to struma fibrosa is worthy of further attention. This brines up the entire subject of bacterial thyroiditis and tout thyroidius. It seems logical to conclude that the distinctions made in these groups are not justified.

When one considers the anatomical location of the thyroid its rich blood supply its proximity to the throat and nasal passages it undoubtedly be comes contaminated frequently vith bacteria of the ffora of the mouth and nose and by bacteria from distant points with infections. The rich blood supply of the thyroid in general prevents bacteria from propagating Thus the presence of an absce s on the one hand vith a specific o ganism isolated and an acute nonsuppurative thyroiditis on the other are in a large measure the result of the bal ance of the virulence of the organism and the resistance of the host Usually hecause of the rich blood supply focal or large abscesses seldom de velop Thus as Crotti stated a bacterial non suppurative thyroiditis is only a phase of a process whose last act is suppuration and there is no way of tellin beforehand which way a given process will turn If there sa pre existing area of disease as a colloid adenoma this would ob-

viously be a loc is mi to is esistantiae and such a gland would be more susceptible to an inflamma tion of the supporative or nonsupporative va-Sumerous organisms have actually been identified in specific supporative thyroiditis in cluding the streptococcus the staphylococcus Bacillus col Bacillus typhos s and the pneumococcus. This supports the fact that the there d is often moculated bacterially. It is well known that the blood stream will sterilize itself with surpri ing alacrity after showers of bacte ia of different type by injection or from septic foci. Often the only clinical manifestation will be a chill and fever Therefore in the thyroid these same con ditions exit After contamination with bacteria via the blood stream or lymphatics, the thyro-d becomes sterile because of its rich blood surply Only the local toxic effects of the bacteria or their evotowns on the actuar epithelium remain. Th cond tion results in the socialed toxic nonspecific thyr iditis which may be of a mild or se ere nature and may regress with lew chinical symptoms or may progress With marked actuar de struction and release of colloid a second group of irritatin substances are freed in the intercellular naces namely there I bulin and decenerate nonviable epithelium. These substances must be resorbed. Whether a proteolytic enzyme in the colloid exi is whether it is activated if existent and whether it exerts an inflammatory effect if existent remain a question. Recent resear h sugg sts the presence of such an enzyme. This sec ondary process of repair and resorption is long and may or may not be attended with fe er and toxic clinical symptoms. The end result is replacement fibrosis of the locally damaged areas. As De Cource (11 12) has emphasized there is often a local perithyr iditis noted at the time of oper ation which he believes creates a pe iarteriolar ibrosis with thickening of the rterial ntima and media. This condition may produce a compensatory fibrosis of the thyroid gland. He has compared this with Goldblatt's description of a compensatory fibrosis of the Lidney after constriction of the renal blood supply Thus in addition to a replacement fibrosis of damaged lobules there may be a secondary compensators fibrosis of the cland of a progress e nature

Inflammation of the thyr id by a specific filter able virus is a possibility but there is no evidence for or against such an a ent at present.

This concept of the inflammators or on of strong and its mant cell variant is borne out experimentally. Chemical poisons s ch as phosphorous and sil e nitrate cause a torue thy roditis with a histolore p cture of actuar desert

erat on desquaration of epithelia cells seated colloid and cho one and active cellular in literation. Do Ouervain found that the ritrod ct in of bar terral torus into the general and throw of creation and smallar effects. De Quervain noted that the injection of a pure cultiver of bacteria into the arters of the thyroid could pass throw h without effects or m b trace the disappearance of colled desquaration of the epithelium and leucosi te militation.

Further there : a relation of the thyro I to in fectious di cases in man Sokoloff and Muller in dependently in 1806 first howed that in acute infectious diseases fatty demeneration of the actuar epithelium occurred with desquamation. Rover and Garnier in 1000 examining the glands of people dan from acute infectious d sea es came to similar conclusi ns as in almost every case marked microscop c chan es occurred of a p of f erative or a de enerative nature or both. In pa tients dvin of tuberculo s a more dense scleros s was noted leading to the conclusion that the dens er fibrosis was due to tubercul us towns Similar results were reached later by De Ouervain Sar bach c neluded after investi at on of 67 cases that acute infect one may produce there d histolorical alterations th increase in a e and num ber of alveolar cells their de ener tion and des quamat on I quefaction diminution of the collo d and hyperemia. The connect ve tissue remain in Esmonet found in cachectic conditions such as carcinomatosis tube culosis and leucemia that epithelial elements underwent a fa de eneration G e o reportin on 26 thyro da examined from child en dvin of scarlet fever found similar chan es to thos noted

Thus in addition to a direct local effect of bac terral toxins and bacteria on the thyro d there is a re ponse of the thyroid often in a de enerative form to systemic di eases. This response is to be expected because of the thyr id's rôle in the regu latin of metabolism which i altered by these diseases. Those who feel that struma lymphoma tosa and struma f brosa are different man festa tions of the same process may cite this as evidence in that struma fibrosa may be the result of th direct inject on of the thyroid gland and that struma lymphomatosa represents the de en r ati e response o b rning out i the thyr d be cause of its response to systemic disease. Perhaps this may ra ely occur and may be the explanation of the enoion in Case 4 a male but if so the in e dence of males to females should almos be equal in struma lymphomatosa

The et ology of struma lymphomatosa is more obscure As J il concluded struma lymphomatosa

appeared to be neither inflammatory neoplastic nor degenerative in any way comparable with what is usually understood pathologically by such terms The stimulus for the characteristic picture of diffuse lymphoid infiltration is difficult to ac count for In fact the function of lympboid tissue in general remains a mystery Maximow states that the lymphoid tissue responds to local injury is related to the extramedullary formation of lymphocytes and is related to the formation and function of macrophages 1 Lymphoid tissue is tarely seen in normal thyroids of young adults but is more frequently witnessed in apparently normal thyroid glands of older adults over the age of fifty (Simmonds 57) It may be a response to a local degenerative process

The fact that struma lymphomatosa occurs al most entirely in women in the fifth and sixth de cades of life with an associated progressive ten dency to myxedema seems to indicate a degener ative process in contrast to a neoplastic or inflam matory process The thy roid is subject to exces sive functional demands in women throughout their period of sexual activity namely puberty menstrual cycles pregnancies and the menopause It seems logical to conclude that through the years the gland burns itself out and the lymphoid infiltration and hyperplasia is a compensatory and replacement process for the slowly degenerating acini The rather rapid byperplasis locally of the lymphoid tissu often suggests great intrinsic almost neor lastic activity though not sufficient to relate it to any form of malignant de generation as mentioned by Grabam (26) Whether this degenerative process is preceded by an initial byperplasia and toxic reaction remains a question Some contend that this always occu s and thus they explain the focal areas of lympho d tissue in a toxic goiter

Boyden Coller and Bugher are of the opinion that todine ingestion is a possible factor. However in many cases no bistory of todine ingestion is present. Furthermore few patients have this todi disease of any sort who do not get todine picture of the property of the course of their disease. The frequency of its administration particularly in strums lymphoma loss is evidence of its chronicity and cannot be considered justly as an etiological agent.

Det has been cons dered McCarrison produced a lymphadenoid goiter in 25 per cent of his

Rec. received has sen of the lym boyr or mboure of 100 per of 8 beys be h in an body pend of 8 beys in bo h in an body pend on a 11 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 to body in 1 mph d no. de 1 mph d no

rats on a vitamin deficient diet. He fed potassium nodie sait. He suggested that a vitamin deficient diet was a possible etiology in man for struma lymphomatosa. His work is very interesting and may be significant though in many cases no his tory of dietary insufficiency is to be found

One interesting discussion of etiology is that of Hellwig He felt that overstimulation of the thy roid by the pituitary thyrotropic bormone was responsible for its involution and degenerative changes He aptly makes the comparison of the microscopic appearance of struma lymphomatosa to chronic cystic disease of the breasts. The work of Uhlenhuth in 1026 showing that the colloid release phase is affected by the thyrotropic hor mone is emphasized by Hellwig This work has been carried a step further by the experiments and microdissection of the thy roid follicles of rats by De Robertis in 1941 and by Dziemian in 1943 at Johns Hopkins They found that the proteolytic enzyme factor in colloid was affected by the thy rotronic hormone Administration of thyrotronic bormone caused a decrease in the viscosity of the colloid thus facilitating its release

The end result of a rather large amount of spec ulation and very little actual research is essen tially that the etiology of struma lymphomatosa is unknown Because of this one cannot state with definitiveness its precise relationship with any of the existing known diseases of the thyro d gland Thus one must continue to regard struma lymphomatosa as a clinicopathological entity of unknown etiolog, and not for the pre ent at least a specific disease Struma fibrosa on the other hand seems quite definitely from the cases studied and from reports in the literature to be the result of an inflammation of the thyroil of a batterial origin. The p eudogiant cell type of thy roiditis described by De Quervain does not seem to be a disease sur generis as he maintains but one variant of the protean manifestations of the thyroid gland to inflammation of bacterial origin

### DIFFERENTIAL DIAGNOSIS

Obviously the most important differential dagnosis for these proups is from malignant growths. Due to their infrequent occurrence one s first acquaintance with the disease is often at the operating table. The question of malig nint growth has either been raised of incally preoperatively or imposes itself on exposure of a firm or hird gland. In mustaken dagnosis of ma higmancy the surgical error is usually one of commission and not omission. There is an attempt made at total excision of the thyroid with often unulatively or bilaterial damage to the recurrent

larvinge Inerves parathyr id tetanj myvedema or varving combinations of these complications. One ca e is known in which all the e omplications or urred postoperatively. Complete resection of a struma fibross is a utally mechanically impossible. Complete resection of a struma lymphomatosa is technically east but un necessary, and actually very under inside form a physiolo ical point of very under inside form a physiolo ical point of very under the patient's nell ber and even file by a total receivon of the gland in out pustified except on a definitely postive diamoss of malierant le ion supported by marce copiescation.

The differential features are easy to describe but often diff cult to apply when there is a spec fic ca e in question. In general cancer occurs in 1 to per cent of all thyroidectomies. It is rare for a cancer to occur in a previously normal gland Cancer u ually occur between the ages of 40 and 60 with wide ariations however and with twice the f equency in females. Usually the malionant tumor is nodular with an irregular surface contrasted to the diffuse smooth enlargement in these group of c ses There s frequent invas on of ad jacent tis ues with regional lymph node in olve ment This cond tion may be quite difficult to distingu sh from a late hard struma fibrosa How ever the diffu ene s of the later process e en if confined to one lobe and its excessive hardness serve to differentiate it from a mahmant tumor If the e1 any doubt on review of the clinical his tors gross pathologs or even frozen section it is advisable to wait for permanently stained microsc Die ections

### TREATME T

Treatment should be aimed at rel ef of symptoms. A posture disagnose is se senual. Thus biops arrespective of the form of treatment should be carr ed out as a prefiminary potential tithere any question of the diagnosis at operation or if treatment's lely by x ray is contempled.

In g neral the best results are obtained by the mst concervative means. The u of x ray only following, b opps. In s given excellent results in struma! implomators. If may almost be used s a discription, test. The response is rapid and the gland will shimk, markedly in use in z or 3 weeks. Ard um collar has been described by Renton and associates. Deep x ray of high enou h voltage utificient up to roo to rope or on each side of the neck, in di tided doses of root or. Time ms the all wed to clapse between courses of radiation to allow for shint! lerance of the am unt of radia to ng; en In Ca e 4 the patient had a permission.

regression of hi gland after 800 r to e ch side of his neck anteriorly. In Case 6 the patient had an immediate response to the same amount 800 r within 2 weeks but she had a recurrence of the size of her thirroid after 6 weeks. She received another course of 600 r with evellent results

The effect of v ray therapy on pseudocunt cell the through the ray be sufficient to warrant its use thowe er it is hard to evaluate as this earler more acute form of thyroiditis often subsides spontaneously and without operation \tau\_interpretation therapy is meffective for the late stages of fibrors.

described under struma fibrosa

Surmal treatment 1 carried out for one reason the relief of the mechanical effects of the enlarged or fibrous gland. In struma lymphom to-a the patient i usually in a hyrothyro d state. There f re the le s subnormal tissue removed the better f r functional reaso is provided that ufficient tis sue is removed to relieve mechanical symptoms Furthermore struma lymphomatosa may have a tendency to regress after a number of m the Case 3 is an example in which the maintaine ce dose of thyro das now much less than immediately afte operati n In f r advanced struma fibrosa removal of a strip or wed e of the ne overlying the trachea is all that can be phy cally accomplished in many cases without undue dan er to the pa tient. The amount of tissue exci ed. I course de pends on the findin s with each pat ent W th p eudo cant cell form of chronic thyroid tis with fener perithyro dadhe ions subtotal excision of a I be o lobes or the remo al of a wed e of tissue o er the trachea is much easier. One shild re member however that normal to sue need not be exc sed and that the d ease usually spontane ously regresses Therefore exc sion of invol ed tissue in all cases shiuld be as cinservative as possible

With recard to the actual technique of surgery little need he said. The potential complicatio s have been mentioned Because of the greater mechanical difficulties in surgers on thyroid glands with marked fibrosis and adhes o is to sur rounden soft tissues the freq ency of these complications 1 greater For this reason one must use extreme care particularly with regard to the recurrent larvageal nerves. Damage to these ndoubtedly the cause for frequent tra nerves cheotomes in many of the earl er cases reported and not because of a proore n of the d sease The entir purpose of the operation-t refer ob truction to an airway -is defeated when one or both of these nerves are cut Acute asphysia may occur when paraly ed vocal cords are dded to an already embarra sed irway

for the postoperative safety of the patient the total cord should be inspected upon conclusion of the operative procedure as well as between stages of the operation when it is m progress Tracheotomy may thus be anticipated and actually performed in necessary thus reducing, the right of asphi has to the patient. The use of an intrartached tube for administration of anesthesia may be a necessity for an adequate airway if general anosphesia visuely.

The res lts of surgery in general are good. This is borne out by the fact that so few cases have had second operations. The patients with struma lym phomatosa almost invariably need supportive thyroid extract irrespective of the amount of the gland exci ed thou h less thyroid extract will be necessary if more thyroid tissue is allowed to re main In the more acute forms of thyroiditis with out marked fibrosis relief of symptoms is usually quite prompt and perman nt As one might ex pect the results of surgery in a late struma fi brosa are often poor The poorer end results are primarily because of the nature of the nathology and secondarily because of postoperative surgical complications of recurrent laryngeal nerve paraly sis parathyroid tetany and occasionally myv

#### SUMMARY CONCLUSIONS

Riccel first described a diffuse fibross of the thyrad in 1896 In 1904 De Quervam first de scribed a giant cell type of thyrodius In 1912 Ilashimoto described a diffuse struma lymphomatosa. Since these o 19 mal descriptions there has been much confusion of case reports though at present struma lymphomatoa, as considered by most a climcopathologic entity despite the new but of Ewings opinion to the contrary. Strums fibross and its giant cell variant have been confused in the literature and no attempts have been made to present their relat onships.

Eleven cases are presented with chincal and pathological evidence to support their diagnosis for cases were diagnosed struma I) imphomatosa 2 cases were diamosed struma f bross and 3 cases represent the earlier more acute grant cell va 1 and of struma f bross.

The three small groups of cases are discussed separately to emphasize their relationships similarities and dissimilarities. Their clinical and pathological characteristics are summarized in Tables I and II

Struma l'imphomatosa is cons de ed a d'stinct el path log c'eni i). Its eirology is unkno n lhough it is cons dered a degenerati e disease in contradistinction to a neoplast e or inflammat iy disease. The excessive demands on the thyrond during the sexual life of the female are considered fundamental in the citology of this di-ca e. The excessive demands may be mediated through the hypophysis.

Strums fibrosa and its giant cell variant are considered two late manifestations of the thyroid from an acute to chronic inflammatory, proce s. The fibrosis of the gland is considered first a replacement phenomenon of damaged glandular tissue. In later stages the diffuse infiltrating type of fibrosis may be due to a compen atory mech amism through constriction of the arteriolar blood supply of the gland from a coincidental perithy rodditis.

The pseudogiant cells are merely evidence of the more acute nature of the inflammatory process which may regress or more rarely progress to a diffuse infiltrating fibrosis

Emphasis is placed on the protean manifestations of the thyroid gland to inflammations resulting from bacteria systemic disease and posons. By nature of its rich blood supply suppuration is rare. The role of a virus as an inflammatory agent is yet undetermined.

The important differential diagnosis is from malignant growth

Treatment of struma lymphomatosa by radiotherapy is the method of choice after a preluminary by pay

Surgery of struma fibrosa should be as conservative as possible. Its purpose is the relief of mechanical effects only as this disease is not neo plastic. Radiotherapy may be effective in the earlier more acute giant cell variant of struma fibrosa. The risk of operative complications of parathyroid tetain and recurrent larguaged herve parally as is markedly increased in any radical attempt at extraption of the gland and nullifies my potential relief of preoperative mechanical obstructive symptoms to the airway of the patient

The end result of treatment barring surgical complications is usually good though with struma lymphomatosa there is a progressive tend ency to myx dema.

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### ADENOMA OF THE BRONCHUS

HERMAN J MOERSCH M.D. WILLIAM S TINNEY M.D. nd JOHN R McDONALD M.D.
Rocheste Minnesota

RONCHIAL adenoma is one of the most interesting of the lesions involving the tracheobronchial tree Mueller in 1882 described the first case of bronchial ade noma. His patient had complained of hemoptysi and expectoration of purulent material for 8 years At postmortem examination a pedunculated ade noma was found in the left main bronchus with numerous bronchiectatic cavities distal to the neoplasm. Very 1 tile attention was raid to this inte estin type of tumor until Reisner in 1928 reported a case of polypoid adenoma of the night lower lobe bronchus. Since then there has been a rapidly accumulating literature dealing with this tumor The development of modern d agnostic methods has facilitated a more thorough study of these neoplasms and it has been found that they are not so rare as once was thought There still exit marked differences of opinion amon observers as to whether bronchial adenomas should be classified as benign potentially malimant or actually mal mant tumors. There also exist differences of opinion as to their most satisfactory method of treatment. In order to aid in the better evaluation of these problems we are presentin our experience in 38 consecutive cases of adenoma of the bronchus encountered at the Viayo Cl nic

#### CLINICAL FEATURES

In contrast to bronchio enic carcinoma which occurs mo t frequently among men more than 40 years of age adenoma of the bro chus is usually reported to be most common among women less than 4 years of age. In Brunn and Goldman's series f 4 cases of adenoma of the bron hus 64 per cent of the patients were won en and the avera e age was 27 years Clerf and Bucher have reported 35 cases in 54 per cent f which the pa tients were women and in 43 per cent of which they were between 20 and 30 years of age Mason and Coberth collected data on 60 cases from the lucrature and found that 70 per cent of the pa tients were women. In our gr up of 38 cases 2 (57 9 pe cent) of the patients we e women and 16 (4 1 per cent) were men (Table 1) The a erage age of the pat ents was 37 years and 18 (47 3 per cent) were less than 40 years of age It is of inter From th D is f Med and P th long M yo Ch

est to note that the average age of the men who had adenoma of the bronchus was 35 3 years and

that of the women 38 5 years Adenoma of the bronchus is characterized by the fact that it is usually slow growing and the in itial symptoms and physical findings are of such a nature that the condition is often allowed to go a considerable period before being recognized. In one of our cases the patient had no specific pul monary symptoms the lesion having been dis covered during the cour e of a routine roentgenographic examination of the thorax and in another case the condition had existed for 8 years before being diagnosed. In our series of cases the average duration of symptoms v as 26 months before the diagnosis was established. This is in marked contrast to the experience of 2 of us (Moersch and Tinney) with carcinoma of the bronchus in which we found that the duration of symptoms bef e the diagnosis was established was less than 8 months

The symptoms produced by adenoma of the bronchus may be quite variable. Wessler and Rabin Laff and Jackson and Konzelmann men tioned hemopty sis as the cardinal manifestati n of a bronchial adenoma The hemo rhage is usually described as being characterized by sudden onset and abrupt termination without much blood streaking of the sputum between the attacks Bleeding was present in 54 per cent of our cases but was an initial symptom in only 22 per cent In no instance was the character of the hemopty sis different from that caused by any other type of intrabronchial lesion Clerf and Bucher and Gold man and Stephens have noted that the hemopty sis may be more prominent during menstruation than at other times We have n t observed this phenomenon

In our experience cough has been the most frequent symptom associated with adenoma of the bronchus it occurred in 85 per cent of our cases. In the early stages of the disease the cough is non productive is the tumor enlarges it gradually obstructs the bronchus interfering with the nor mail bronchald drainage and eventually causing attlectuses of the distal portions of the affected lobe. When this region of attlectuses see not arily infected the cough becomes productive of purulent syntum. The occurrence of preceding pruntent syntum.

TABLE I -SUMMARY OF THIRTY EIGHT CASES	TABLE II -ADENOMA O
	FINDINGS IN CASES

		SCHARLET OF	THINIT !	CIGHI CASES
Case	Age years	Tre tm	tas reno	Bro hus tolved
v	3	Pneumonec m	moe	Righ pper lobe
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1.	\$	Po m ectom	Deed	Rih pelbe h man
8 31		Р енторес т		Rah pelbe
F		Lobectom	1	Righ lowe 1 be
Ŧ	\$	Parum et m	1	Lef lowe 1 be
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- 34		Lobert m	mos	V 32 1 be
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М		Duaherm radim ra	rs.	Rahl 1 be
3 31		Dueth row rad m	8 75	Rib mai
2 6	8	Dashma ப்பை na	yn.	Lef lowe lobe
	£1	D h ma radium ra	D 4	Lef I we I be
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3 F		Das he m radium ( ) ratio )	mos.	Lei lowe lobe
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31		↑ res m		Rib mai
М		' restm	Cak wa	Rah I lobe
3 F		Yп	15	Ri h low lobe
F		D h rm and radium	n	Righ I we I be
F	6	Diath ma and radium	yr	R <sub>1</sub> h lowe lobe
F	44	Drath rm and radi m	yrs	Righ mans
F	-6	Duath rm and radium	lur.	Righ man
F		Different and randouses	5 mos	Lei maio
34 F	_	\ n	rs.	Rath lowe labe
F		\ n	975	R <sub>1</sub> h low lobe
		Dia herm	mos	Le ppe lobe
F	10	Diatherm	100s	R: L I we I be
F	_]	Dia h rm	Lode reatme	Lef ppe lobe

"The fire aves in this table are the same as those in Table

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ABLE II —ADENOMA OF LUNG PATHOLOGIC
FINDINGS IN CASES IN WHICH LING WAS

_	AV AILA	BLE FO	R STUDY
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and often recurrent attacks of pneumona in the same lobe was f equently noted. In 46 per cent for uncases there was a history of one or more at tacks of acute pulmonary infection and in many instances the first evidence of an endobronch lesion was an acute febrile episode usually dia nosed as pneumonia.

Another impo tant symptom caused by the broughal obstruction is the so called ashmat if where which may var from sh it whereing respiration to rathe masked ashmat or en severe stridor. Since these timors fairly frequently have lone ped des the attacks of ashma may be precipitated by chain of position and often e paymal. Wheeein was a prominent symptom in

y mal. Wheezin was a prominent symptom in 3 per cent of our cases and was the initial symptom of which the patient complained in 4 per cent.

If the bronchial obstruction allowed to persolve the match the treatment pulmonary supports of the match develops in the distal portions of the affected lumber of the many take the form of bronchists pulmonary abscess pulmonary gangren

o emprema In 23 per cent of o cases there

as clinical evidence of pulmonary suppuration These secondary process es sometimes become so marked that their failly frequently obscure or even obliterate the primary lesson. In fact I ul m nary suppuration rather than the tumor per se is the chief cause of death in most cases.

Since the signs clusted by physical examination are usually dependent on the degree of broncho stenosis and the am u t of pulmonary suppuration they may vary considerably. Over the affected reg on there are usually decreased expansion of the thorax impaired resonance and decrease of breath sounds.

### ROENTGENOGRAPHIC EXAMINATION

Direct or indirect evidence of an endobronchial lesson may be obtuined by contigeno raphic evaamination of the thorax. The tumor mass can at a times be clea by outlined by from raphic students by clear by outlined to from raphic students and at times can be outlined if a ro-interior rame and after the bronch have been filled visit by odded oil. A region of stelectassis is indirect existence of a neball bist cition and should easily one to suspect an endof ronchraft tumor. In 7 per of the first response of carse an obstructural, lesson of the bronchus as suspected on r entgenograph c examination.

### BRONCHO COPIC EXAMINATION

Although lop v of a specimen obtained du ng a br nchosc pic examination is es ential in deter



mining the exact nature of any endobronchial lesson these neoplyims generally present such a typical gross appearance that the bronchoscop it is frequently able to make a correct d agnosis from the gross appearance alone. There is partial complete occlusion of the bronchus by a smo th freely in vable soit vasculist mass, which may appear pink, red or purple. The surface of this poly i die ion i characteri treally smooth and rarch ulcerated but sil it contact may preepi





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tate rathe ma ked bleeding. L wall the e no in ation or and its of the b chial wall

### PATHOLOGY

Althou h adenoma of the bronchu p e ents a almost che ctert tie eros appearance the fin I diagnost mut rest on positive mic oscopue dence. In Il of our S cases the diagnost of adenoma of the b onchu was establiched b positive mic oscopic e den In of the cases this was based on the tierned elendoscopicall In 1 fiche cises (Table III) the lun on a port on I the Inn continum the tumor was audichie for mocipe study while in cases necrop material was all a all ble

G I to I The adenom and co derbil n i e the mallest bern millimeters in damet and the lar est S ent met san t lar e-t dimer i Th I with and with the ped cle trachin the tumor t the bonchu anced gre il Generall that et it to than tof the adenoma to the bin halw il was narrow than the greatest width if the tumor I case that was er strain a all trated in Four the regreted thange of this tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the tumowas S in the Issue and the strength of the st

but the pedicle at it attachme t to the br nchal wall wa only a mill meters in diameter

There is a te dency for aden may of the bron chi t infiltrat the bronch il wail a dispersion bonchul fu ues. In is of the is, cases in which the lim was a sail ble for it dishere a in a not of the bronchul will a disperibronchul ti sues (F ) In the remain no zea esthere a no multitat in of the neopli m it the bronchul will pe pheral to the cast] e the main mass fum them within the binch blumen.

Adenomas invar bl n ef m the main tem or lar er bronchi. The r ht de m e fre quentl invol ed than the left I of o rra-es the lesion a located in the htl and n

cases in the left I n (Table I)

The cond to n of the lun d tal t the neopla m depend on the decree of bronchial b truct which the tumor ha produced Vari u der ees of bronchiecta; were enc untered Since the neoplasm na usually situated in a la e br nch b onchiectasis hen present freq e ti invol ed I r e portion of the bronch als stem either I one l be or occasionally if the ent e lun m piti in ariabl accompanied the b nchec In all but of the 3 cases in which the 1 n was available fit dithere was some brinch ectast E mele hown in Figure . In the c & the aden ma had been fulrurated e d s opically and th b lk of ol structs n removed The br nch nd pneum t emained howe e a d were l els respon ble for death

The metal the crowth we eff ind utide the brain the cases of ad nima of the binchus a which need on was performed. In trace only was a local fulus I mph node in olled and that node was adduct all to the neoph in

Hist lo cfe t s The eare man diffcult co nnect d with the accurate hit lone d mos f the type of eopla m fr m a sm ll peci e Aden ma of the l no is I kel t be c fu ed with othe les as h tolomeally. It mut be diff re trated i m hi hl mal ona t sm ll cell br ch > enic ca cin ma Thi i import i beca se fithe va tl diffe ent p ono-t f th tw lesi n on a cellular ba it in toltent mes eas to diffe entiat bet een these tw lesi n Althou h the character tes f th 1 d f al c Il are Ittle n th two t pes f neoplasm ee eral diffe ential features were i ni h lpful M tot c fire es can be f und n the tumor cell of the hon ho enic carcinoma the btae all absent th aden ma type Degeneration fith tum cells (p know kar) rrher and necro ) m chm ec mmont dn nbo cho nc car moma than nad ma

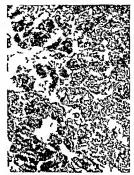


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Another lesson that must be I flerentiated from a lenoma of the b nchus is the hyperplastic type of epithelium is the seen ab it in fects of the lun (8 yre). This should not caus of fleuths be cau e marcts usually occur in the peripher of the lung there aden mas are not seen. Because of its per phe I locatin in this lesson is encountered at ner pas but in the from one senountered at ner pas but in the room of an infarct of lunder the lung there are the lunder the lung there are the lunder the lunder that the lunder the lunder that the lunder that the lunder that the lunder that the lunder that the lunder that the lunder that the lunder that the lunder that l

The type of cell which is c not tently present in a lein ma of the luin so a fail is small? In one related hyper for mits mf then cleus IT revisit the viral in in the six of the cell. We have been impressed to the remarkable h to it is similarity fall (8 of fleent a lein mas. VI tits figures ere practicall, about in the neople six cell is all 6 cent.

The tumor cells c in stendt in ke n attempt to f macinu but are rarely very a coessful in the rattempt. The result is that the cells gr up them set es mot alone for profecils in the hin coport, f med lumen or else the y group them selves it c rd of cell (Figs 4 a d 5). Womash, and C ahma ee in shered that similarity c it between the c tum s and m d tum s of the shir yightil The falla f cartil, ge and the shir yightil The falla f cartil, ge and



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bone in the substance if these turn is is not diffeult to elplain, when one considers that incus of through the bonchial wall does occur and that the bonchial wall has cartilge in it which sometimes turns to osseous its use.

Invasion of a hymph node as present in mly it case. In this particular instance the involved lymph node was adjacent to the tumor and to seems possible thirt this process does not report the sent met stass in the sense of a tum remb limbut, at their represents a lirect invision of the hymph node (fig. 6). In no instance in this series lid met stas occur to the ther lung or outsile the thorough care to make the series of the materials that the deferrent ates the a lenoma type. I les on firm bring the care in many care in the secare in the sec

Bet cen the g o p and cor is of epithelial cell there usually was a thin strima of cinnective ti sue. In this stroma ve e found large numbers if thin

alled blood vessels! ed by en I thehal colls. A noticeable feature f II aden mas of the bronchus ha been their vascular ty. It is no wen her that bleed ng s a prominent featur in the clinical course of these neopl sms fn fact m ny aden normal morph log call s mulated neopl sms of Ilood vessel. The priblehum ove lying the tumor vasf equently tact alth u hat I me it was ulcerited. In ne inst neet te tumor cell seeme!



to a se directly from the perib nehial muc us glands (Fiv 7). It seems probable that the sur face epithelium of the bronchus which is the usual source to the ori in of bronchio enic carcinoma

sn t lways and indeed may ne er be the s u te from which the adenoma or mates

Adenoma of the I n<sub>o</sub> 1 in man ways s m la to types of neepl m n other parts of the bods n mely basal cell carcinomas (rodent ulcers) cylindromas carcinod tumors of the append and ileum islet cell tumors of the pancreas and ade n mas of the parathyroid Th s m la ty is be ad not only on the slo mess figrowth and tar diess to met stasize but also on morpholomic grounds.

It is b rous f om this study and others that adenoma of the l n is a neoplasm of the lun e e is It cannot be compared in so far spo nosis is conce ned with bronchin en c carcinoma. lthou, h occasionally t resemble b onchio en c carcin ma Morph lo ically for the most p t the cellular picture sutterly different. The slow ness of growth and low metastasizm f ctor are features of h nehial aden ma which temp e t fr m the realm of b nch o enic carcinoma H w beca se of the fact that t has the potenti alt es f invadin, the pe b onchial t ssue and 1 mph nodes (F 6) and because t can become a les obstructin the h nchus space-occups and thereb prod cing bronchiectasi and infec tion of the lun bronchial denoma a lesion that if left untreated will eventually kill the patient For these reasons t seems bette to think of bronchial adenoma as mal mant thereb dmit t n their potentialit es for killin the patient but



at the same time sharply different tin them from the odnars type of br ch enccc

## PROGNOSIS

In study the poon si of cases f bronch i aden ma it is a tere to to divide the series ato those n which treatment was s orcal (pne mon ectoms or lobectoms) and the n which treat ment was more conservative (survical diathermy radium or roentgen rays) These data my be summarized from Table I In 14 cases in which lobectoms or pneum ect ms was performed there w s r death or a mo tal to rate of 7 2 per cent. In 22 cases in which treatment was by means of surgical diathermy rad m or roentge rays there were d this o a m reality rate of o per cent These 2 pat ents d d not d e d rectl 2 the result of the treatment but me months later of ther causes Tw f the patients idn t re cet e any tre tm nt one of these we ha e n t been able to trace and at the time of riting the other was still all e and ell a year fter he eggs trat on at the clin o

#### TREATUR T

The esa diff ence of op am olsen is as to the most sati feton method fetoals bron hall aden ma Generalls the dees s resistence attempt n and scopper em I ef th lesson and extripat on of the less o by means flobectoms or pneumonectomy. The method I be employed must necessarily depend n many fetors is that she part is sage a digentral state of health the location of the tumor a Tespeciall is related only the control of the control of second to

arn pulmonary suppuration and the degree of peritor chall infiltration of the adenoma. The fact that peribronchial infiltration is so prevalent to favor lobectomy or pneumonectomy, as the product of the control of the bronchis would send to favor lobectomy or pneumonectomy as the procudure of the co. On the other hand lobectomy or pneumonectomy e en for adenoma of the b on other is still a very formidable procedure and one that as yet carries with it a definite element of risk. Furtherm or peribronchial extension of the adenoma of itself as exper ence has demonstrated is notalways as serious a state as m. the everected

At the present time it is our practice to employ the conservative form of treatment in those cases in which the adenoma is attached to the bronchial vall by a comparatively narro v pedicle is mo able and is situated in a bronchus that can be adequately and thoroughly visualized bronchoscopically. The degree of persbronchial invasion is as a rule extremely difficult or impossible to e aluate f m gro s inspection Bronchoscopic emoval f the tumor is all o indicated when the adenoma is situated so close to the corvna that surg cal treatment would be inadvisable and also when the gene al condition of the patient 1 s ch that I bectomy or pneumonectomy 1 unduly haz rdous The advanta e of I ronchoscop c removal les nuts e mparat e safety. It is imperative tl at patients thus t eated be followed by at least yearl b chose pic checks to be certain that aden ma does not recur stlee s no other method to detect early recurrence

Lobectomy or pneumonectomy is the pocadure of the text hen the ade oma: stuated in a bron ch a that cann it be adequated by susuitzed bron cho copically. It is generally preferable in those cases in which there marked evidence of associated pulm mary supp rative disease. It is all o peterable when there is obvious evidence of per bronchial; iffiration or hen an adenoma of the bronchus h is been treated on loscopically and

tends to recur The d ant ge f surg cal removal of the t m r les primarily in the fact that after the le i once been remo ed this manner recu r nees re extremely r re hereas follo in enl cpcre mo al such ecu ences are c mp t ely com m n With the great strides th the e been mad in the feld of thor cic su gery and the rel ced urgical m rtal ty associat d ith lobect my r pneumonectomy for adenoma f the br chus are employing this method of the timent with a f equency The conservative form of teatm nt still has a definit field of s fulness h wever nd still holds a ver al ble place i treatm at of a lenoma of the bronchus

At times it may be of advantage to combine the two methods of treatment. In Case 23, Table I the adenoma was situated in the left lower lobe bronchus and was associated with marked second ary pulmonary suppuration. Surrecal treatment seemed indicated and was emploised. On exploration the lun was found bound down by a mediatinal mass that would not permit pneumonectomy or lobectomy. Subsequently, the tumor was destroyed by endoscopic means and the patient has remained well up to the present time with no evidence of recurrence.

The problem of treatment is further complicated by the fact that in certain instances favorable results may be obtained from reentgen therapy alone as is well illustrated in Case 34. Table I in which the patient i still alive and well it years after treatment atthough the tumor itself is still present. Roentgen therapy as a rule does not seem to influence the size of the adenoma mark edly althou h at times it does seem to have a limiting effect in its development.

### CONCLUSIONS

Adenoma of the bronchus is a relatively com mo tumor in olving the tracheobronchial tree

2 It occurs usually among younger persons than does carcinoma of the bronch is and in con trast to bronch o en c carcinoma is more com mon among women than among men

3 It is generally slow growing and usually gives rise to clinical symptoms o er a much longer period then carcinoma of the bronchus before the dia nossis established

4 In our e pe rence cough is the m st frequent and earl est symptom of adenoma of the bronchus Hemoptys's asthmatoid a bezer and recurrent bouts of pulmonary infection are other common symptoms.

5 Aden ma of the br chus generally presents characteristic bronchoscopic picture but the final d agno 1 must rest on micr scopic examina tion

6 Adenoma of the b nchus presents a characteristic m c o copie peture. Muto t figures are usually absent. The type of cell is consistently a fer its small round she cell which does not have m rked byperchromati m of the nucleus. The 1 mo cells consistently make an attempt to form acm but retarriely vers successful in the attempt A noticeable feature of all adenomas of the bring has been the vascularity. In no instance 1 our series did metastasis occur to the other lung or outside the thorac can via. From our study c feel that adenoma of the bronchus should be regarded as a neoplasm of the lung sing. Girst

The method I treatment I be empl ved in at eas of adenoma of the bronchus depend on the ituat on of the tumor the device of second in pulmonary uppuration and the patients gen all condition. In our e-perience endose pie de truction of the tumor and destruction bour call extripation to the tumor and method to the unit of the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and the tumor and tumor an

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## AN EVALUATION OF THE COFFFY I METHOD FOR URFTEROINTESTINAL ANASTOMOSIS

VICTOR F MARSHALL M D a I SCOTT GARDNER M D New 1 k \ w 1 k

HE may and varied procedures de v sed for transpl nt the ureters nto the b wel sug est that no h hly satis factory method is yet available Coffey I peration in our hands has been re halle though not ideal. The technique probably is not the final solution of the wlole p oblem nor is our application of it perfected. This relatively old proced re has been ove shadowed by em ph's on newer methods. There is no consecutive on newer methods. uti e cases are here reported to dem instrate early results and to offe some c mpar on with repo t on other meth ds No attempt is made to discu s the general treatment of bladder cancer exst. Dhy and other conditions for which urinary diver on

may be advisable. The conditions for which transplantation mu ht be d e are c mmon Hence the techn que pref erably sho ld be one readily mastered by the well trained sur con Some f the meth d de ser bed in the literature seem to requi e unusual man pulat e skill If such hi hly specialized meth d yeld definitely superior results then it behooves surgeons and urolo ists in p ticular to acquire the needed special skill. Upon e 1ew 1 g the lit rature e find no method which has p od ce i results superior to those follo Coffey I method as lemonst ated clinically b a con ecutive series if rea onable si e. The Coffey I method is mple d direct In general h hlv speciali ed technique are le s enduring tl n s mple d ect procedures. The c are of cou se not ll e cepti ns Most r hable operat ons n t

only are b sed upon estal lished surgical prin ciples but I o apply these principles as d ectly as the situat on permits

When the Coffey I procedure is u ed ll steps may be v sual zed so that the ope trk w what sid ne Man pulation of pp ratus vail rectum intr ureteral c tt g dependence on the nec ti n effect of a sutu e and the lke epre ent essenti lly bli I maneu e s W tl the C ffey III ( 2 7) and Hi s(6) pe tions the c t tin throu h of the pec al necr ti g uture

must occur or complete failure results This fact is recogni ed by some proponents of such method who have advised placing auze or a tube in the lower box el and including this gau e or tube in the necrotiz ng sutures. Then if the cut throu h not forthcom ng tract on on the packing or tube is added-an essentially blind maneuver W th levett's method (II I ) the formation of the actu 1 stoma is accomplished solely by touch and is tested by passing ri disound through the el st c bowel and ureteral walls Tangential cuts have been made v th Tewett's instrument with d sastrous results from leaka e To avoid some of these difficulties Jewett has devised a set of bulb sounds. He I o advised inflation of the

ectum with air and more extensive mob lizat on of the bowel In passin one not uncommon fa It of the h his special zed methods is that the proced re may become more and more complex

n th each perfection Manipulation and contamination can be re

duced to a min mum p rticularly when b th urete s are transplanted at one operation. Of the last o cases nour series only I was done in ty o sta es The H ins and Jewett operations re quire t o stage to complete ny one anastom is (thou h the first stage of both sides is usually done at the first operation while at the secon! the nastom sis is completed bilaterally and often ther surgical procedu es are car ied out) Ad hesio s encountered at the seco d stage have been a major problem but caref I attention to avoid peritoneal injury has greatly rell ced this hazard (12) With the Coffey I method however any o e an stomo s i completed at one stage and does n t have to be dissected and handled agan Mnp lation tend to decrease I lood s pply and nerease the possibility of soiling. As vill be n ted later deficient blood supply under lies many failures Absce s f rmat on is not d e to the 1 evitable sli 1 t soil g (v hich the peri t neum readily overcomes) but rather to sloughs ma sive so lin and the leaving of an open f st lo s commun cation with the pe itoneal No foreion bodies remain in the lumen of the

ary tract Catheters increase the h zard of



Fg Autpy pecum fapt t ra 44 y rs d 8 m th alt bltral et rm dostmy f xst phy by F | N H N 59

nfection. They may become pl. ed. th. defeatin their aim of producin owd drains of Furthermore they may comple a the blood supply of the urete, and lead to slow him with the sequent leaks, a The Coffer II method (-2) is the classe a cample of ureterosy-mo dostom, with the use of eatherters. McC mb (14) and G. G. Smith (1) stron ly Lavored the results of the Coffer. I over the II method after tru up both operations. The experimental upon the true of a successful lar ely due to calculas formation (1) any perm ment for eval both in the urman's contraction.

(t) Any perm nent for on body in the urmary tract greatly increases the haza def stone for mation and intractable active infection. Ho

mation and intractable active infection. Ho et al. Adequate innars, utipit per rection hould be obtained. Other factor permitt in a plan their ac outpit heis the with the best ult mate result the least in L. and the minimum number of operations it the procedure. I choose that he series between the consequence of the orone operation. It mess in all of these cases up in wa reco cred within a hours and the major to had urine in the rection it the cod of the procedure. Those who had spinal a eightey a howed less dela than those who had general anesthesia in the intre-crees of 9 coses all upper tracts which if included properate of a nimed it fort in p the immed i po toperate operate. Two upper tracts which had no function by in traving us prelowaphs before translating traving and function after the operation. Theoretically the Coffer III method and some of the state methods in his produce read dama evidence to the translationary to be also methods in the produce track produce the product of the constitution of the constitut

The wide area of c ntact affor led the uneter and houel by the ln nide te u h provides adequate adherence i prevent leaka e allows for s me collateral c replan n between the two roans to lessen the post sions which should take ten on away from the site of critical union. This true fall meth od util zin Coffey s main principles Coffey s operatio s H mins Je ett s Hinman Fol vs and others. It is not true of the Maydl and Bergenbern (4 13) operations and while some beautiful results have been obtained by these operation they have been cenerally unreliable and are no eld m used Al o the Maydl and Bergenhem operations are un uitable in a program for bladder cancer since a portion f blad der remains attached to the ureter

The val e action for which Coffe det sed the submucosal trout his an add tonal advanta e but the presence or absence of the val e act in cannot always be correlated with the clueal results if a putent lives 44 vens and 8 m nihs after operation works regularly and raises a family his transplantatin cert it is a clinical uccess. Autopss was bitained on such a pitent but no valve action could be dem instrated (Fig.

but no valve action could be dem instrated (Fig. ). The perat Fixler (20) attempted to obtain \(\circ\) each of the trueter and to the upper surface of a convex \(\frac{1}{2}\) both content and the occlude the urreters. This method \(\frac{1}{2}\) do \(\frac{1

With the C. flex I operation no special constructed matruments renecessars the until par torn velect n ben sufficient. Them to the decision of the constructed by the construction of the

py 1 g na bef 1 ft d ft ht t pl tt nght kod y the gh th t satu! t ry \ H \ 37 347 d I ked Th th

sometimes show a tendency to multiply them el es for example into sets of varyin caliber pull or angulate the ureter are prevente l In r varying cur atures Again a method usin special instruments should sho clearly superi r results to the simple direct Coffey I to warrant the expense extra training and trouble in obtain

and using that tool

U eter langulation should be avoided as it may interfere with blood supply as vell as urmary drainage Any portion of the bowel fr m the de cending colon to the rectum can be used The bo el may be mobilized if necessary fhe e i however less latitude on the right side than on the left and hence a greater length of ureter is neces sary on the right to permit a nonan-ul-ted co-se The ri ht s de was always transplanted first n this ser es

Absence of ureteral tension a sin q a n s ccess is readily accomplished by the Coff v I method Tension decreases ureter I blood s pply and tends t make the anch ri sutu e cut throu h The operator sho 11 be r n mi d that tret n on the u eter dur g d ssect n tem porarily le thens it Some e cess le oth m st also be allowed from 11 bo el an lu teral mot n Lack f re lun lancy let een the I west retr per to eal f tin of the ur ter I the an tomosis is we believe one of the comm n ca es of f ilure

R lit e imm blanti n of the perati este is of ta ned by tacking a flap of par etal per tone m ove the a ast mosis I erital i n t alte ed

but gross displacements of the bowel s hich could



Atpendosaft ght dodysft lftt pltt 1 g 3 t j 1 ghi pent t d t right Left I sat f try \\ \ \ \ 37 34



Fg 4 P t perat t pylor me hom g satufty codu thought bt thlithyd phos Lit tomulkdid t dath Mil

addition the anastomost 1 pa tiall or wholly extraperitonealized hich may be advanta eous in pre ention of general pertionitis in case of leaka e We have had little e perience with ext per toneal techniques but on theoretical ground unrecomized tension in ht result when the bowel is allowed to dr p back toward its normal position. Fecal and urmany fistulas seem mo e e m

mon after the extraperitoneal methods

What then are the results bits nable with the
Coffey I operation s ce after all the real value

of an operat on les nats res las

Our postoperative mo tality is 10 2 per cent We include their death regardless of cause occur rin between operat in and the time for hospital d scharge Priestles n i St om from the M vo Clinic repo t a m rtality of 7 per nt with 31 cases usin the Coffey I operation by an extraperito eal techn que Jewett us n his o a meth od ind cates a 33 per cent mort 1tv in 33 cases but the metal to mbi last 10 cales was onl 10 per cent. The last 15 patie is in our sines of 30 had bilateral tran plants with ut a m rtality Hinman (1 ) n 9 6 in complete revew of the literature concl ded that the perat for uretero atestinal tran plant t n d e f r ll ea on and b the vari us method had been abo t 30 per c t but in cancer cases alone the

rate a much hi her usually nearly so percent Our hosp tal mortality with the Coffee I method seem reasonable comp r d with other report but ous not a lar e en u h eres to allo the co clusion that the method i definitel sure rior H we er con i lerin the sic ses from the Mayo Clin ca dour on all d ne by the Coffe 1 method m inl on cancer patients it cem per missible to conclude that the perative mor tality from the Coffey I procedure is about 13 pc cent This it ortality | less then that reported on any other lar e series b anothe method \ 12 De cent m rtal to beverthel so i rather hi h and mo t particularly does it appear so since the operation s often a prelimi ary to fu ther major surgers such s t tal cystectoms

Of our 4 po toperative deaths 2 were directly

due to failure of the operation

FW \\ II \ 37 34 58 y ld whit f was f und t ca ci m (the new team of ta ra becase f difficultes es lugf m maked besty f wa fra pl tedt th l em d wates or text in a 3 Asd f m temperat th first d ) it pe t 443 t tas th pe to d street ·th 750 lbm) disatety th as deq t dig limabidd espe t U Libral a tm Thilt tran pl ted Dec mbe It') Th sat f t ry f 156 2

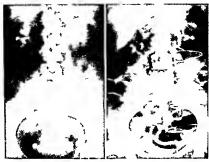
it) nere g satt (y) to do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that do so hib peed on nere that the sed peed on nere that the sed of the s

Atpoy (F 3) Id thit the ht t had septd Imit tahm tith bold hi draued du thy t th pe t eal ca ty The pe t th bo I had h i i mpl t ly be by blak IL tres Ag ď lized th pe t t peset hbg"
on the bbly
trail(d) bet the beces or poth thi D to rem ted f tra pl t t bl gests poor blood surrly Εi as the distributed d e I pos bl that th th pe od f th se

JR VIII \ 30 5 60 5 ld.m l m d ca in m fih bl dd had bit ral t l pla tat \ on! th tid inteso nal esthesia. The post per t rse w ry especif `d y h t mperat si faliry O th th pe t р d gn f seps beg bices bo t th le t perati day ta greally b t th pt t ત ત્વે 1 nsn an ed d mbillo ree ded de nhillo ree ft fil ppoti m tp i reman d Il ii th l t Blood ea tog th jth pos perati day as 8 m lb ram pe the over 1 30 th day fd th O h th dy fners w gried tin ra py logr phy (f

b byd ephros 1h 1f A t psy as t ps mited

nc h was n. Firu oy os an ida so al meeu m pa ha had hid eral ran-planta so ou de ma ma to al f consecu cases wi hou hospital most ty ou, he withou complications.



Fg 5 Pp t lift dp tpe t ght t pylg m h gblt lift d tradtdgee fhyd ph D thd t umt Nih N 3 86

In both these ca es leaka e occurred after at least I week Tl s fact sug ests that the ureter had sloughed The operative and autopsy find ings 1 d cate the same P obably the commo est cause of le kage is failu e of blo d supply to the ureter leading to slough Of course actually leavi g an open communication with the peri toneum at peration s Il allow leakage but ans method which does this ith regularity will be abando ed al ruptly. Also if s ch does cour the s gas of leakage should on the ave age appear much earl er than in our instances. If the ureter 1 said to have slughed o t the failu e of blood supply seems obv ous but f the urete s said to have pulled out the idea c n eyed a that trac tion per se was the cause Sutu es cut throu h by ischemic necrosi Tension duces uret 1 blood supply and als pulls on the ancho suture (in effect t ghten n it) Yet if th fa lure of blood supply we believe s tures vill nt cut thu had he l sh ld proceed Moreover Freak n or untvi of a chor sutu es mu t be rare Th s I ughing out an I pull in out of the urete are both due to i clema in the final analysis. U less infects is very r lent and the s necrots g by eason of t c ty local fail re of blood supply is the ultim te cause of slough n fr m infection Al o letkage is n t due to the contam nati occur



Fg 6 At px pe hwg dq t naste



Fg7 Atpv pecum day ft bltralt pltati hw tat tm ses t poctu bot lghig tmp fnht t Dithd t d il Mil So

Fg S Post F rati tra pp lorram (5 m t po ) it m l f t mporary l it ph ost h d p mpt ppe f dy both pel LL( \lambda H \lambda 33 76

rin in the properly dine perati in We have a othe patient who developed an bacess after dischall ge from the hospital (e.e. a e. J. B. N. J. H. No. 3,5 646 described under the late compilications)

The other of the 4 de this in this series were not due to local failure of the operation. In both the urmany tracts funct oned well as indicated cincully a shown by intraven us pyelogram r as demonstreted at autopy. The first case was did not pall tion and in retrospect was poorly chosen. The second likely wold not have did high properative care been better.

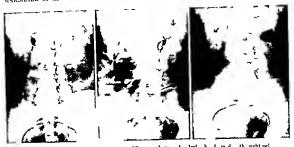
HMNNHN 3 f mt ! 4 .. fth bidd fmea had an t n.ı f th es ltr mpl t ry m a dr 1 n t m ff ed li 17 venot m Th ht . . . . . . . . . tres. as tra pla ted of fli d by f brd 154 d unsatist ry tp t f run f on th ectum A hest ray film dysl led p lm ry ta tases L 8th post perati d i h th n n p t h d ased t equal that f m th rs pl ted nary dra e theo h ! ! be pen ealm cot edt be dit esi d th th 043 Tb pla ted J ly th 4th d aun f b 1 and rse th 4th d f h sec dtr pla th bd ninal w und separa ed d t th pent m Th d es mp th 1 De th occurred th day (f ) t pe f 6) re ealed pra all

t pe f 6) re ealed pra all h h ti ty ro d th recent peratire w unds. M tastati carran m as prese t in th man pel as bl dd mesetry materal boes digs vig b sees peset the pel social dishib ca cam (that applies) diship moccup i thill best There is good du that dill to be mid pyl phat for merely liassons.

و (الأي 'M 11 th o m fth bidd dem d hdhli i tointestinal 1 04 M b6 023 Deta d larys 12R037V tp t m h the The blood om lberam pe 19 main mam th 7th pot pe dy Pl be m times ir en) m ked O bos d or red Dgit! mbat ca d ac disease sed Bubt pl red th 8th potpet d v b t makey with the potential of the history of the hist th post can me f bladd t oscler to beat fire bla al plm nary ed m result Dit and bredly th mun diat se fd th.

ad quatel treu d'Articularly, the fi il finds was n't low red. A preoperat e elect cardogram h 1f i nly t chycard and moderate fett ent cultar prep nderanne. Th' that gate af he se se of tuit a l'used us tocen to u aute i us n'ut poo ble filu fibe tra pla t il cars le el th' fat l'ute me scleal in til t'ill of the operation is il bilione in terminate met to en postoperat e mana emet t

In etrospect the c rdsa co d to n s n t



F 9 P per t 1 ft d post p t m ddt t pylgr h g blt thyd o-

In the reported series the nonfatal p stoper at ve complications are often not mentioned and only seldom described. A perusal of case ht tories when included howe er indicates that nonfatal complications are by no means rare-in fact in some e ies they are more the rule than the exception Our total complication rate includ n both fatal and nonfatal 1 as 23 o per cent The non fatal complications n inbered 5 or a rate of 1 8 per cent We define postoperative complication as any untoward occurrence between operats n and the time of discharge which has added a hazard t or prolonged an e pected sm oth con valescence In other words 77 pc cent f the pa tents in this eries had a s tisfact ry rec very in the hospital. The nonfatal post peritt e c m pl cations are outlined in the follo n. The e were no fee I fistulas at any time At a see nd admi ion o e ureter as male t lran tem porar ly to the externer Ly operation (case J B N 11 No 358 656 described later) I recept this I instance the e vas no u in rv drat ge from any wuni No patent h I pe ma nt u mary live's n except the transplant to

\ F \ \ I It \ 396 3 klim t had lta eo blt rai Oct 1 3 044 Th post pa ta 6,71 sat f t til th getti g t f bed f dy p d cya osi id by pre-c d Tre n 1 begu v ml l \ 1 1ai y ter th 1 6 d fth Itdd h Mth 1 ed pno k f pl n y jt m t

phos A loui h f m d th nght pel

ld m 1 1 1 H 1 f th bl dd filt t g ca pl t M ch t t lt pll t Thpt thd h P ogres w lÿfbl /bt d t d y th t tith othp tpe t sat f t rv gpt t dt h hth bd m tosed th ft d d sch g d 3 ld b rimnal perat n. d d fca m tos tmith ddf 1 t i pl tdt th bo lbec se ) I É Th right t th bo th lf th tf th bl dd sat f d (mth th t rv Ιt rse led d 1 yed 1 d ys 1 t th et ht Th bl F II 944 h rd d th t g 15 1 ted t IJg F bru y a 644 t ph os to t i byd th ht th 1 lt tp t pe t m oo 1 3500 d v se. 1 pc t 1 ft t my đ 944 1 11 d by s t d sappe ra ı 1 I blood rm I Wh th 944 th 1 1 sc 1 th tlk pyel g m both | 1 es d d m (Ig Si Th h bee tt L flf pye t wh hor ed 3 It pat till th k daily d lipi 53 ye ld 300 30 t t go that I Th ght d tra et ted J ly 943 th tli \ gu tó 943 \l



th first perate the tp tpe e turn cub tim t rath first 4 h ra b t t dily ascd oo o 2000 cub c tm trsped ; ft d s pigram the resided maked bydro-ddia edf t the ht Bease of th ht Bcase of int ro 1 f 3 eek I w d bef pla tat n med t th th sd Th blood med rmldr thipe of Th u nit og as I bril pe od I ad 's I B' in the cc d pe btn y tpt ppe d t be deq t Th tre levated t milberm pe ce tby blood th 6th post pe t d 3 th 1 ly set med t h m ked bit albud obod d layed fun ti

We con ider the our vorst result from a piedoraphic aspect (F 9). The patient he remained symptom fee hole e er and is climetally tell. The blood urea into e1 thecked at interval in the Out Patient Department has varied fr m 3 to 6 in ill vrains per cent it hem is recent was 3. A calculus ha fermed in the r. Jht kalney this be in the only incidence of six he fermation except for a patient whose renal calcultures emixed be 5 befer te transplantation and ho his had a recurrence since the rete o niest nal anast mos

IM / IH / 11934 0.3 ldm 1 wth tra me ti mary conti was bjected t bl t ! ret rointes nal na t mos The has plat d Decembe 043 Th 750 f bnl nary to pe rect in was usat i try. The blood rea nitrore over its 38 mill ram no Transplitti fhilfur w more π postpo ed ι eek m Film thee dta t all

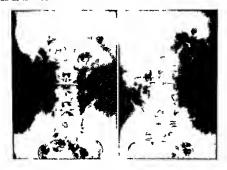
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What re ults were obtain d regard n the urina i tract proper. App rently ir nsplanta tion of one ureter and h arion of the ther i not a r re urolomcal practice. It is ur opin in that these pat ents sooner o later e l'all the func t on no renal tissue t is possible to cons rie Loat on of one u eter condemns that side t nonfunct o nd nece samly defeats o e of the m t important aims fu ol on amely preser ton I the best pos ible e al lunct n II the side t be it tel is nonfunction and i repar abl dama ed the e m v be s me i st feation We can m gine un s al ci cumstan s here transpl ntation f one of the urete s m ht be mposible but n s ch c nd t n s met n this er es hich incl des palliatri cases l'aluable function h s turned after operation offe ntly ften to ou seres t make us al av try to tran plant both u eters. The dd d sk seems sl ht c mpared to the poss ble g ns Ii ne side l ated nd the transplant f l d sa ter ob-

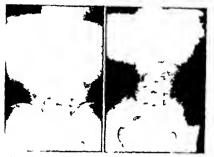
I ated not the transplant fildsater obush fillows—arknts siht Alsotsnt nc mmo for the leatels det cause truble for example pnephos

These 39 pats at had 9 u ter (the r ht le f bein double) f these funct el b

## MARSHALL ET AL COFFEY I METHOD URFTEROINTESTIVAL ANASTOMOSIS 667



intra enous pyelowam bef e operation of q d de safter operatin in The 4 patients dying post operatively had 8 functionin upper tracts even though a of these transplants leaded as decessed p exicush. After the original d scha get o kid n 39 became nonfunctionin as judged by intra en us pyelogram in da neph ectoms was per f med on anotler. The hoter, indicates that one other patient ded of enal failure of mintra state of the exicusion of the desired that is of a definite improvement in function are utilized in the follow.



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B f re perati tw tf mpts ro d t m k
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t eneral ensis and reabsorpti n than actual failure of the renal parerchyma (Care VI H No tor pre you I described) The other pate t em in clin call well and she i pleased with the result thou h we are n t (Case \ \ 111 \ \o ,60 o pr rously described)

The long term outc me of the perat a regard enal function cannot be foret 11 f or ih st d. We have noticed honever that many pyelogram a few m nth after operation how umpr ement e the nes taken t

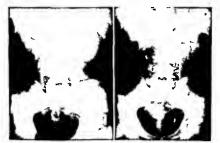
weeks A clear indication of the lut real particula I diffcult when most of the late death ha e been due to calce. Thu of the treatients now kn in to be dead fite leas the hospit! oded of cace of u em a (Case \ ) H \o (a 1) nd 1 of phl bt (her reported)

WF \ TH \ 394 58. f3 va ldf 1 had or test 1 na.t mos blat ral milta co 944 T Sept mbe out both to me dim to the both pla ed eccessing free the me dim to the history to the cores as the core as the cores as the core ght die sel bea h ft ta hm tahm im to the ht oth sairly
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The procedure in all cares is the Ciffer I operation the particular attention to the fil Louin

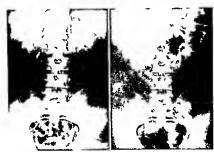
A complete d gnosis and gener l evaluation was always made Intravenou pyel raph usually sufficed but repeated or retro rade studies s e e made when nece sars to a clear harmous n the stat is of the upper tracts. A barum enem the perhaps n t essent at at axs has been of salue It allos s the perato to plan hi method f procedure. In at least r in tance preteral transplantation was contra dicated because f extreme diverticulo i plus sims of hi el infection. If howel symptoms should appear after ureteroentero tomy the kno n pre perative c n d t on of the o gan's ould be mist advantage in The function no capacity of the anal sphincter should be determine! Usu lly the history and d stal examination are s (Cent b t if in 1 uld testin by enemas a in order

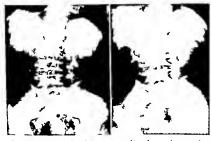
Bilateral s multa eous transplantati n d ne whenever feas ble T enty three so per cent of the so cases eres done with 2 death a mort bits of 8 7 per cent comp red to 12 4 per cent mortal to in the 16 d e in a parate of er t ons This difference is not a mificant because a chan e of only r m stality f m the sec nd t the first are p would make these stems 10 nl62 ner cent respects els lo complicat na ele

attributed to the sin le tage plan Preoperative p eparat on f the b el 1 most important The us alre m n vas 5 t 6 d s on 8 to grams sulfasurid ne lails enema every



ht p) I Tam It ra f trypy lograph es 1 \ 1 H \ 3 43



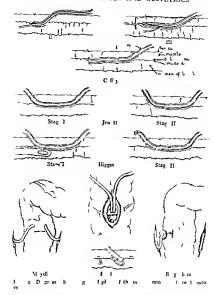


f g 8  $\Gamma$  p t 1 ft d po t pc t ght py 1 gram h g good h  $\sim 111$   $\sim 38$  450

other in cath rtc (usually citrate f magnessa 2 occ) on alternate laws and 1 rs the det was reduced to clea fi all the day fe e operat n n d both an enema nd the catha tic were given liso sulfalare gram 4 times a lay we started the lay befree Anema ayitaminos e etc a e app opriated trivite ble f e peration

Choice of anesthesia has varied but in general continuous spinal has I een q ite satisfact v ln infusion is gi en during operatin and ally transfusion.

At operat n the filly ng are emphiced good exposure gentle hindling obtaining an alequite len the fureter protecting ureteral blood supply arranging the anast most to be



the teens on sutu in which is merels app or mat n and p ritally monoblem the site of transplant. The uneter becomes temporarily lengther dur disection not the bowel's lend applaced fr m it natural local—facts the borne constant! in mind. We mert the first uture line and the set of the inchorn, is time with a second line of int rrupted fine silk, suite is Special care mut be taken that the pper end of the nat imos; is not closed to this bout the urter by makin the suiture! es too local.

We have not he-stated to tran plant dilated

massic e moethan centimeter diamete. Several we co e i e at meter in liameter. ha e the impress in that re ulis with moderatel dated u eters re somewhat better. Prob. bb/ the reteral blood's pply is large in the cir size allows fir hinh, ge and hibrosis et lea in ult match a good cal ber

After operat na large rect I tube s kett n place e nstanth for fr m st r i ay Th t be ch n ed twie dally and mor ft ni fn it draining Chanem isd n t insure pate I lso because a hift n post it n mpr es drainage Th's decompression relieves presur

Poo

## TABLE 1 —ANALYSIS OF 39 PATIENTS WITH COFFEY I TRANSPLANTS

on the suture lne prom tes output and de cases poss he mid rectal reabs pt on Enemas and it igations are contra indicated since they a resease that a overlep essure Ra et a mild cathar is a sidicated about the r th day. A low est due it is c nt under for weeks. Sulfadaza ne o 5 Rams 41 mes ad 9 is g en for about weeks to in da bacteriostatic quality to the unne. Usually a W ne steen gastric dra ge is stated immediately affective that the summer of the summer o

## TABLE II -ANALYSIS OF 79 COFFF 1 I

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The t t plate mit col (put)	3
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ît and t	3 4

## SUMMARY

The Coffex I operation for ureterosigm lot my has the followin good characteristics at its relatively simple and follows fundamental principles die city no extraordinary surgical skill is needed in special i truments are required no foreign bode remain in the urinary trait immediate urinary output can be expected clear visual attoin of all steps may be obtained the ureter and bo el adhe well tension an l'angulation are a widable relative immobil atti in spissible anvires de is completed at one stage and the early resil sa are fairly satisfactory compania.

favorably with results obtained by other methods our results with 30 consecutive patients are in did cated (Tables 1 and 11). The operative mortality from all causes was to 2 per cent the mortality due to local fail re of the operation in the wast of the operation of the operat

A total hosp tal complication rate of 3 pecent fatal and nonfatal is too high especially, in view of the fact that the procedure is so often a prel m nary t further drast c the app. If wever the tesperate pil it of most of the candid tes

s usly reported

provides considerable justification. The symptomatic relief is often sufficient and cation

We have attempted to limit dict on to treterosi mo dostomi itselfandi urposch avoided di cu sions of treatment of bladder cancer e strophy fistula etc. If ureteral tran plantation to the bowel were a beniem high lisucces ful procedure it no doubt vould be serv widel used.

These operations were performed in the years 1941 to 1944 incluste by operator usin essentially the same technique the Coffex Lope attorn Online of the operators had had previous experience with ureteroenterostom. The surgous were at the New York Hospital Steens 4 McLellan Drey Whitmore Gardner and Marshall at the Memoral Hospital Yumbik and Mar hall. None of these case records except the one his Poles method (a) has been tree.

REFERENCES

C R C S G m Obt o S 4 03-6

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## SURGERY OF THE MANDIBLE THE AMELOBLASTOMA

## IOUIS T BY ARS MID I ACS a d BERNARD G SARNAT MID St Lo is Misso

¬HΓ amel blastoma develops from the cell of the enamel organ during a par ticular phase of tooth develor ment. It i found most frequently in the mandible liss in the maxilla and occasionally in the pituitary gland tibia ulna and ovary For the purposes of this report only the ameloblastoma of the man I ble will be considere! Although the tum r is c naidered to be unc mmon there have been over 400 reported (1 4 5 6) Both seves are affected n alout equal frequency. The ameloblastoma has been reco nize I at birth and as late as the eventy sixth year the average age in Rob son s series was 37 6 venrs (6)

The ameloblastoma is generally described as a bemm ne plasm although in a study 1 3 o tumors 45 percent showe i metastases or histoc e idence of malignanes (6) A better kn wn characteristic of this tumor is its per istence and tinle cy to recur after operative ntervent n The tendency for the amelol lastoma t exally is preliably due to inadequate urgical

treatment The pu pose of this eport i to con side (t) the surg cal treatment famel blastoma i the mandible and (2) the reconstruct: n neces sary subsequently

## BRIEF SUMMARY OF DENTAL MISTOCENTALS

A brief review of deptal historenesis Il facili tate un lerstanding the origin not only of the amel I last m tut also of other iental an malie (T ble I) T oth develorme t may be he ded nto three st ges (1) gro th (2) calc i cata n and (3) eruption Fr the purp c f th s rep rt only the first stage (growtl) ill be cons lere ! Th stage can be further sub livi led int (a) initi t in (b) pr life ation (c) lifterentiati n and (d) ap-Dositi n (Fig. 1)

Intiat or Betveen the sixth and n eks of intra te ne lif an i ar l pr l ferati u of the ral eq thel m Oep legin (Fig 1a) the lental and ge Da If 1 1 to 10es n t occur there vill be n too th le 1 pment an I an lontin li be the el n cal c n lit n (2)

P I fer ti Cellular if l fer tion c tinues u til an nv g att n takes pl ee an l the e nnec tive t sue which borle sitte in ag iel I the l l port n c n lenses I f ms the dent I Vision 1 Departm

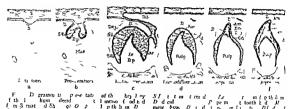
papilla D p the primordium of the dentin and pulp (Fig. 1b) During this period the early form of the odont me ari es

Deff estiate n The enamel organ In og the chort mates from the invaginated epithelium gives rise to the outer enimel epithelium Oee the stell te reticulum SR the stratum inter medium SI and the inner enamtl epithelium Ice (Fi c) It is during this period that the amelol lastoma arises from the enamel organ This occurs within the first fe wears of life al th u h no act, ty may become manifest until s me years later Enamel is never found in this tum r If tootl development continue normally h wever the inne enamel ep thelium will differ enti te nto amel blasts the enamel forming cells Thus o e can read ly see that ameloblastoma is not the correct term because the tumor arises from the enamel organ before the ameloblasts have dif ferent ted The term preameloblastoma is more ccurate

In addition the od nt blasts differentiate from the adjacent connective to sue of the dental pupil la The dentinoenamel junction which forms the basic p ttern of the tooth is determined bet een the inner en mel epitlelium and the adjacent connects e tiss e of the dental papilla (Fig. 11) It siduring this period that the Hutchinson ineis r and mulberry molar develop (9)

lpp st fd ti denamel In this stage a cu p of dentin s fo med and with this stimulus the p eameloblasts clange to functioning ameloblasts and a co responding amount of enamel is f rmed on the o te p rti n of the dentinoenamel junct on (F | je) When this formation has been i it ated there is a synchronous recession of the od ntoblasts an i meloblasts from each otler I cremental I vers f enamel are app sed one on top of the other until the cusp is fully formed Subsequent lave s are apposed at the sides until the e o n is complete (Fir if) Systemie lisease during the period sometimes affects enamel for m t n (7 8) Afte f rmati n of enamel has ceased fo mation of dentin t ntinu s to complete the root DINGNO IS

Ch scal t dings The ameloblastoma which i most f eq entI seen in young a lults is cl rac ten ed by a slow progressive s elling of the jaw u u lls ne r the angle The tumor sometimes at



fth I hum deed t I moso (odn'd D ded F pen thoubid M in Srant dSu 900 F l pith in D neck by a D d to mil t D d d tall plg D f d talp pl E n mil i muse by a D d to mil t D d d te am l pith in S. R t H t tool t blast E miD d t

tains larke proportions (Firs a 344) e tends toward the clavi le and we his several pound. The growth may be accompanied by pain. There is usually a hi for of a tooth or teeth ha involved extracted from the a caserial tears per low his and of everal attempts surmeally to chiminate the tumor. Fistulous tracts leading to the oral cavit and secondary infection of the tum r are not uncommon.

The buccal plate of bone is usually expanded mo i although the limital b ne may be expanded to push the it ngue to the oppo it is do of the mouth. The bone i sometimes so the near that will cruck like an e — shell. These are late finding after the tumor has chan ed from the solid to the custic phase. The part cut may be seen on all it patholome fracture has occurred. Only occas on 1 is do true is mo of mal manch appear.

Roetten e aphic find ne The roent enormain servesasa plumblead unconthed agnos of cytic lesions of the 1 w but the total degrosis depend n the ero and pa t cula ly the mi-roscopic examin tion. The cent enormal most all able for the early damass, of am lablastomas of the raw when the tumo is still centrally located ha n t expanded the bone and is 1 the s hd thase It I at the time when most of the mand ble s yet not destroyed that the tumor ca be rem ved ompletely with no er deformit re s It no to the patient. When the amel bla t ma h s become custic and onsiderabl I r er th cli ical finds is are ob ou and the cent nomam of neumary alue in showing the ext it f bor destruction (Fgs ,a ni 41) The e constant ch ta ten tic oentg n graph c de cription of the am I olastoma (f: ) The mult locular appearance and the scallooed bo d r re b no means path mom n The m l blastoma

g ant cell tumor care noma and ther leans which are destruct ve cannot be positively differentiated from each other on the roe it on stamp

Goes & A see The fin lines on cross examina tion sats with the stale of development of the amelobla toma Analysis of 210 case re cale l that it percent were c stic 24 percent e both existse and olid and to a percent a cresol ! (6) The clasefication is riotrary and comb na tions of the s lid an i existic tumors are fo nd in varyin derrees. The solid tumo which usu lls represent an earl er stage in development i fine granular consistency and encap ulated The e may be one principal mass y th nurrer a smaller daughter areas. The c st c type u vally represents the s lid turn r afte custic des pera tion (It ac) The contained flu d may be cl r ellow to red and either of a mucous o ser us consistency. The b ne is expanded and may be

parchment th n (F 4b)

It rates e ful n; Interpretati n of th
microse p e finding in the amelokistomat fact
t teld an unit stand n of the histology of th
en mel organ (F 1). Home states there are
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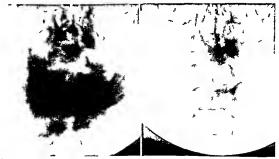
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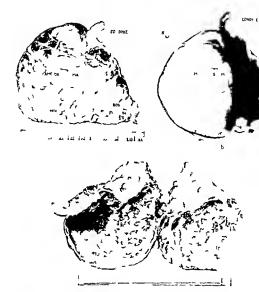
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## SURGICAL TREATME T

Insamuch as radiation does not affect the am lobbastom anter lik the treatme tof this tumor of the jaw is primarily uroral. B th the surreal poach d the procedue which is carried out depend not only not the diamnos of the tipe f tumo but also upon it citent. In some instances the et int of the tum will be such is to determine the type of uroral primarily process.

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proach In oth r case it sit in necessing it.

In the type of turn right which or sie lin and to determ e subseque it! the suil sign oach and poculiar in the bas of this line of the constant







In the latter group either prelimina v 11 1 v r examinati n of a f ozen sect n at the time of pe at on 15 of advant se An accur te mic oscop e di gno s vill gi e tl e operator e urage to do a radical operation f necessary r ill si e him confidence in the less rad cal procedure II ever it has not been our fr et ce rout els t do a resects n I the raw in dealing ith the ameloblast ma The more acces ible less us are t rst rem ved locally. The patient is w rned that e peated postoperative e aminations vill be neces sary over a long period of time to disco er p ssible extens n of the tumor In many 1 tances this local e ct ion is dequ te an in t def rm ng In other in tances (1) whe l rge port n f th mandible is in ol ed ( ) viere the tum r h s definitely invaded beyond the c nf e fb n or (3) where maccessible reas of the m ndible are



With gh f these 1 h p 1 t be 1 b t C V M by C )

m hed so that lead excision cold not be ade que te rescribon f the mind ble i the firmari treatment f chince (Fi s 2 and 3). Sometimes the chince of hether to do a local excision or radical esection must be mile only after sur; cal explosu e of the area of inv. Verment. E pecially is the true vere the surge all approach is from the outside through the neck. In almost every in stance, here the sing cal approach is firm the inside f them with local removal; done Int and app. act. Having made the fecision

t loac servative local remov I rather than a resection of the mandible adequate exposure must be g med by I eeing overlying, oft ti use an I ttached mue per osteum ove the c mpl t tent of the tum r Follo ing this overlying.

b ne should be removed a lequately s as t give a complete e posure of the unde lyin tumor nd



to permit part all oblite ation of the cauts shich results from the rem val of the tumor This obliteration 1 accomplished by collapse of soft ti ue into the cavity. It is preferable not to runture the capsule of the tumor tself dur n the operati n In many inst nees of the less loculated t pe of tum r the rowth may be remo ed com pletely and without pilla e Under the e circum stances there is less no ibility of c ntinued growth of the tumor

Many of the mult locular tumors have irrefu lar outlines and cre aces in the bone at which no nt the tumor is usually broken into during the process of remo al One should ne er start out to do a curettement remo al of the t pe f rowth

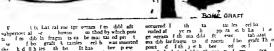
th hatnter em tith tilt ed with pooly d fined cyt pl m bo d es These re ded by col man il wh h re hype h t posses th recul ra eem t t red 1 ly gr th m g type [ 1 bl t p th h m or collare t m bbt dif hasem tim bra (Sept be 6 out O \ ledfm! ed 3 tirst see My 3 98 lbth f f y 1den fam ibl tm t as m edithro h tra rai pp oa h sect fth m dibl It t t t med et t Ugf d bl tope ted pa tly mpl td( 3 Rdnaw beeq thy m ppc d f g led th to \od les soo bt ti ift d f beailt t been t m t blood o.to d ts fih hest ealed m ltspi od les both | gt ld py as pefem d ou dhilom h fth tum thil gare idit bem mphig all dh 1 lon d tical with th tum rs perat pecim ( )

It is much better to attempt total enucleation where possible In multiloc lar or m e inva ve tumors one can become invol ed in a p ecemral re moval of the tumor howe er and a cert n amount of curettement vill be necessary. U der the e circumstances it i obv o that small fra ments of growth all be left behind and neces

tate removal at a later date To prevent the difficulty caute at on of the casits has been recommended. This cauterization may be either chem cal or thermal In general the critics m of chem cal cauterizin a ent 1 th tone cannot accurately determine the depth of pene trat on f the chemical so th t cauter zati n te d to be ther too great or too I ttle in extent The



Sm the h und has healed and bo y nu ha



ma dib larfragm is d nserti I bo graft Th of poset d fth j w h bee ed oc! ta hed pli tash ldan th pos n i gm

TABLE I -STAGES OF TOOTH DEVELOPMENT DUPING WHICH CERT IIN DENTAL ANOMALIES FIRST APPEAR

TABLE II - HISTOLOGIC CLAS IFICATION OF THE AMPLOBLASTOMA (12)

extent to which penetration goes and destruction is brought about with the thermal agent is belier regulated than with the chemical. If the amelo blastoma has not been removed completely it has been our practice to use the electro surgical unit or Box e knife with the coagulating current and log over the exposed bone surface. Heavier cauteriza ti n is done in areas of greater contamination with tumor tissue. The disadvantage of this proce ture 1 that a certain amount of bone will be dev 1al ed and sequestration will occur. In the meanisme, the p esence of the devitalized bone will delay heaf in However if the lumor and its imme li le bony confines have been completely rem ved r d stroved cure is almost sure to result

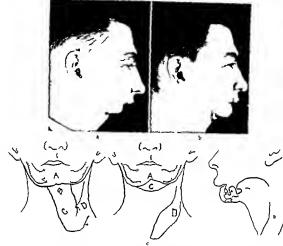
I' to al pp oacl The external approach for both resection of the mandible and for local e ci s on of the growth is the same Thi ne sion shoul I parall 1 the natural fol 1 in the sk n of the neck. It should be made underneath the mandible and should be adequate in extent to goe complete exposure The c ur e of the l vest branch f the f ci I nerve in the neck shoul I be remembe ed This nerve can be preserted if the apploach is ca ef lly planne l The incisi n shoul l be marked on the skin with the head in a n m l po tion and hould be 2 centimeters belo the gle of the m ndible A flap containing skin ubcutan

TABLE III - VARIOUS APPLIANCES USED TO CONTROL FRAGMENTS OF MANDIBLE AFTER RESECTION

d bi oc 1 Ш

eous Itssue and platy sma is then elevated. This in cludes the lower pole of the parotid gland and soft tissues ante r to it Unless the lov er pole of the parotid is elevated with this tissue the facial nerve must mevitably besevered Theentireramusas vell as the angle and most of the body may be thus ex posed Having exposed the area of the tumor re mo al may be done : one of three vays The procedure of local emoval by shell n o t tle tum r

d applying the cauteri ing agent may be fol lowed in certa n cases. In other instances t is possible to do a partial block resection of the mandible the Albee sa is used to rem ve the tumor and contain g block of bone 1 ut a br d e f bone is left to mai tain the contin its of the mand ble The is rarely feasille Tie thir i method is to resect the m nd ble (Figs and 3)



F 8 Peoperat (tak \ who 2 944)
d b post pe ati (tak n F bru 17 94 ) ph tograph i pati t had livith terror portion in db i m beu put b p d ea Th had be
bee los feoficies Th se bundt th t

The ite fresection of the mand ble h s usually been det rimined befrel and b stud in the reenteen eram. It po ble s me portion of perio-teurn left into tob id the eap All bleedin i controlled. Where possib mu oas is sutured o as to se een off the m with from the neck portion of the ound thur in a les containingt on The neck would closed curatel with drain insected.

Mitte a figure me is Wherever re ection i dine min pi ii minist be made t maintain ther min framm in of the mand ble in a near prope positina posible pri to bone graft epair (Table III) If there has been de-

m dbul Irama ta as l'ased A k hest i p se edt gr dded sof i Th sam flu w cot t hue the hucral lou d be lood f h h bo graft his been ansert d beel thy D yramm be pese tat fso c and se flight b

articula in in zero al. (the am. then in the anter if fra ment mu the considered and in this case the simplest and best method from naming position is the winter the remainstead from occlusing it is with the remain tend occlusion in it is own the remainstead to the implest all where there are tends no both the mapplest all where there are tends no both the resection his sheen can the angle of they will obtain the art I and armity remains as the post for seement some tream in the table and in the post in offerment in the post in framm in in its post point. (Fig. ) A motion in the hard has been used to cantol the



I 9 Ppt (the Nomb 94)
dbd potpt (tk Dmb 93)
phterpht ptthhdith tlite
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h ild Thbypt tthdtib
manngm dbl dth tlas spt

etd th timp m diblaf \tau th the dfullnes fth ift d fth f b Th d ttd d eat th post fth g ft th tipld p the boypt fth g ft which i p th ttg pot fth

posterner fragment (T ble III) It is essential that this sp ce retention be maint aned until the e is complete soft tiss e healing. Otherwise as soft it such ealim occurs there will be progressive dislocation of the fragments by the pill of the nevformin sear it ue and the various muscles. This dislocation will interfe e with later repair by bone graft. This condition is especially common where mucosa has been reme dealing a gaulatin various has been left inside the mouth to heal by second ary intention.

Reconstruction file defect Many past ents has e paperarelly been content to c ninues that have the defect in the mand le rep ed In is me instances it has been possible for them to wear dentures. Unq estionably, the pitent is more c infortable and his stur it is nis me normal farepair of the resected area. I them midble can be obtuined with boy un in \(^1\) umbe of methods may be employed but in general. Iree bone graft is them at desirable pre cedure.

In order to carry out the pro-edure of a lee bone graft satisfact of it, certain thin is are necessary. The fragments of the m right which is main must be fee enough so that they can be not only placed but all o maint and in their proposition during the time that the boe graft is he he gir place (F - by). It is a tremely important that the co-erring fit is e be adquate in quality, and am unit to give good co-erring the control of the con

me and nourshment to a bone g aft. If the over by ng tis us has been dama ed to the point that it is scarred and tight the graft is likely to be extruded If it is necessar; to d sect dense scar tis sue from between the ends of the bone before they can be restored to their proper position then this must be done prior to the insertion of the bone graft to prevent mouth contaminat on In certain i stance it may even be necessar; to apply addi tonal soft tissue by means of flaps (Fire 8) to re pl ce scar or to supplement inadequate covering mater al which i pre ent This is done prior to the nection of the bone graft. This is the trade in one patient (Fir. 8) who had be two be negatis because they we eplaced in dense scar ti sue.

The bone graft may be e ther myssive using the hell or 1 If thickness of the rib or 1 ection of the item or it that we be that as in the case of the steepe is the 1 graft taken from the tibia. This type of graft may 1c applied in several thick nees es. Regardless of the type of graft usel 1 it is desirable to ove lax the ends of the mandible with an inch or so of the bone graft. There possible makin the bone graft two inches lon er than the delect. In sime in tances the portion of the graft which overlaps the ends of the mand ble may be thin while the port in bet ent the ends is thicker. Sometimes a T-shaped graft may be employed the the charm of the T projecting in between the

end of the mandable. In all instance, the hone malte should be in as le e contact with the man dible as possible and anchored to soft tissues or even to the hone steelf noth sell or fine tantalum wire suffires

Where there has been a disa ticulation of one side of the mandible a rib graft contain a carts la e and hone can be utilized. The cartilage end can be fitted into the temporomandibular fossa and the bins end attached to the remaining mandible (Fig. 6)

#### CT STITLES IND CONCERSIONS

The ameloblastoma are e f on the enamel or and rin a part cular phase of tooth develorment namely morphodiffe entiate n Because the cells from which the turnor in es are not is set differentiated into amelobla to the term tre amelohlastoma is more accurate

This tumor s f und mo t frequently near the an le of the mandible in young adults. Michou h the clinical hi tory and roent, enograph c findings are an aid the final darposis depend upon micro copic examination

It i slot growin and unless completely re mo ed will continue to grow (rathe than recur) The ameloblastoma seldom becomes truly mali nant

Curettement cautement on 1 th deur and radiation are inadequate therapeutic measures The lesion hould be (1) completely enveloped if un locular ( ) cauterized by heat if not too lives and multilocular or (1) if extensive resected in chidin, a small amount of normal hone. The same the best method of treatment because they gy the greatest assurance of no turn r bein lalt

The surg cal approach and procedure ( r van ons arrelablistom, s and the nere sars sub-equent reconstruction sur are has a been considered

#### REFERENCES

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## RIOLOGIC INVESTIGATIONS OF A NEW ABSORBABLE SPONGE

## JOHN T CORRELL Ph D HAZEL R PRENTICE M D a 1 E C WISE M S k lamazoo Mche

ECENT reports on fibrin foam (4 9) and oxidized cellulo e (2 3 7) indicated that a material with the properties of - a sponge that could be absorbed by the animal body might have utility in the gen eral practice of surgery

In a preliminary paper (1) there has been announced the preparation of a water insoluble gelatin ba e sponge which fulfilled the re quirement of an absorbable matrix. The pur nost of this communication is to report the d tail of our investigations pertaining to the biolo ic uses and to sue re ponses to the new substance

The phy iologic absorption of catgut has been shown by Jenkins (5) to correlate with its enzymatic digestion in silro ponge was found to digest in itro in pep in solution The digest time nas influenced by the mode of manufacture to the extent that some specimens digested in 10 minutes while undigested fragments of others persisted after 24 hours There has been obtained evidence that the sponges which required the longest time to be brought into solution by pepsin in il o also demonstrated prolonged physiologie absorption in living tissues

Most of the animal and all of the clinical in vesti ations including a recent report in this journal (6) which have been made with gelatin sponge to date have employed material from lots which were standardized such that a 100 millimam cube of sponge was completely di gested in 100 cubic centimeters of a 1 per cent solution (0 37 per cent HCl as solute) of U S P pep in at 37 degrees centionade in 30 minutes

Many different sized molds have been pre lare I from the foamed gelatin. The tough porou nonbrittle ponge after drving was Prove A Rece is Libo e so I Thi Lip it (mpany and il lie 1th Pen (1 Llabora ra Prece ed part bet in Luma ra e ra f h ocal Rece is C 1 W h gt 11 6 1 5 4 b rac of h id 11 b 1945 Veter P D wender when all Chem ra f h in ca Chem 1 oca y

packaged and sterilized in the package by standard dry heat procedure. If autoclayed there resulted a complete loss of the desired physical properties The final product could he handled with sterile technique and further cut to any desired shape and size (11, 1)

Pledgets were found to wet readily by din ping them in a olution and kneading vigor ously in the fingers or sterile gloves for a few seconds. When the damp mass was returned to the olution it rapidly imbibed fluid and as sumed its original shape and size. It was our practice to wet ponges in the particular olu tion which we wished to carry to an implant

An experiment designed primarily to ascertain if this slightly denatured protein material would be phy iologically absorbed was conducted with 21 albino rats neighing about 300 grams Sterile precautions were taken The animal were anesthetized with ether the outer surface of the left hind leg shaved and prepared with an antiseptic solution (mer cresin) An incision about a millimeters long was made through cutaneous subcutaneous and fascial layers to expose the femoral muscles

With a blunt instrument the muscle layers were divided and a dampened piece of gelatin sponge (6 by 8 by 8 mm dry) was introduced Well above the deep implant a silk suture was taken to insure elo ure of the muscles and mark the site. Silk stitches were used to close the cutaneous wound

Animals were killed each week and reopened It I week the discolored f r inspection ponges could be readily identified weeks they had lost much of their original size and appearance It 3 weeks only a mall tran parent gelatinous pot could be found at the implant sites Nothing could be identitied o days after implantation. In all 21 case the wound appeared clean and well healed with no evidence of reaction that could be attributed to the pong



F Abob blg lun po Thuil trau and cates h with mat nalm; be cut t any iz h pe t th tum f pplicati

The blood clotting enzyme thrombin has been recommended (§) as a useful hemo static agent. Its clinical utility has been shown (4 o) to be enhanced if the thrombin i applied in an absorbable porous matrix that doe not require removal at the time of wound clo ure. Such a procedure eliminates the dan ger of reinstating bleeding, due to the need of withdrawine a die in.

To gain information on the possible bemo static properties of relatin sponge when used in conjunction with thrombin studies were made on the control of e caping blood from several artitudils provided bleeding point. In one in e tigation 6 rats were anesthetized with ether and the livers were expo ed. In the left and right lobes of the liver stab wound were made of sufficient events to produce a free flow. Small pieces of ordinary gauze were packed into the cut in the left lobe. Into those on the nicht were inserted pled ets.

of gelatin pones which had been wet in a thrombin solution of a potency of 500 units' per cubic centimeter. Before insertion the wet pones had been cuttly pre cdin teril gauze or towel of that they held as thrombin olution only about 5 per cent of their poten tall liquid en, organ, capacity.

Of the suzze filled wound sether con timued to bleed or hemorrha e started again upon authorizad for the pack. Only one indicated a control of the hemorrha Blee lin from the wound packed with thrombin damp gelatin ponce stopped in 2 minutes or 1 The e packs were not removed since remotal would usually be contraindicated in clinical practice.

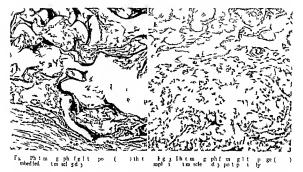
Often the spon e pledret that erved for hemo tasss on the urface of a vound methere was no overlyine pre sure appeared bulks because of en or, ed blood and evudate After a few moment vhen the clotting was complete pressure applied gently but i rmli to such dre sine caused them to he as thin hims Because of the inbrin now precipitated in the interstices of the matrix there i as no further tendency to swell is infearth!

Additional data were obtained by claim is evering the tips of rats tail and attemptin to control the bleeding. U ually ordinary banda es did not stay the flow until con id rable blood had been lost Gelatin ponge damp with thrombin a ain demonstrated sat 1 factory control althou h the tail had to be adequately immobilized or the wound properly die sed to avoid mechanical los of the nicidests.

Another investigation was designed to study further the hemostatic qualities of g.l. attin sponee with thrombin and by hi tolo it examination to e alizate more thoroughly the bolone; ab orbability of the poin as well as observe any cellular or it sue reaction it mi his pro oke. Also u ingo the same animal and technique the physiologic propertie of tibrin foam and a starch pone, is were in esti atted.

Twenty-ei ht 300 gram rat were ane the tized by intraperitoneal injection of milli grams of evelopentenylallylbarbituric acil

Clothe act vi as fardized h tim ou labo tory that f cu um sol so he d cube ume pecas, and ed howes plains in sec oul has no no as fored ha pot or i young pt cubacce me



(cyclopal) per 100 grams of body weight Both hind extremities were shaved and the areas painted with an antiseptic solution (mercresin)

Inci ions about 5 millimeters long were made throu h the cutaneous layers in 4 differint regions and the underlying muscles were exposed. All implanted piece measured for 5 by 8 by 8 millimeters. Those used in conjunction with thrombin were wet in a solution having a potency of 500 unit per cubic centimeter.

In area \( \) the right leg the muscles around the fat troenemus were parted and a piece of fibrn damp with thrombin was introduced Occasionally a saphenous vem was in tentionally ruptured the resulting hemor rhage vas controlled by the fibrin foam thrombin nach.

In ara b the right the b femoral muscles were separated and the pieces of starch some form twith thrombin implanted. The material mide available to u at that time had very little cole, its strength in a wet condition thus difficulty was experienced in making un twolen implants.

Into area C the left leg was inserted gelating point damp with thrombin A am a vein was often severed to create a blee ling v hich

the gelatin sponge thrombin combinati n readily arre ted

In area D the left thigh a piece of gelatin sponge wet with a olution of penicillin which had a potency of 5000 Oxford unit per cubic centimeter was implanted

Rats were killed at 5 day intervals from the 5th to the 100th postoperative day. The implant areas were visually inspected and pecimens fixed in 10 per cent formalin solution for histologic study the tissues were embedded in paraffin and stained with hematory lin and cosin. Using this stain on unimplanted fragments the gelatin sponge showed a mesh of purple fibers the fibrin foam a pink and the starch sponne a hade of pink.

The considerable data accumulated will be abstracted to present only the pertinent information and thus avoid being voluminous

Tibrin foam implants by the reth postoper attice day were dissected as yellows h lumps which when cut in two appeared as heavy walled fibrious capsule containing the original pledgets. These lumps gree progre well maller the longer the rats were maintained a little nodule was found in one out of two examined on the reeth postoperative day. His tologic examination of this specimen showed a remnant of foam with evidence of the sur



F 4 Ph t m graph h win un beo bed remnants f g lati po ge ( rr w) filtrated by 3 g naecu t d ys ft mpla t ti f pledget int rat

which pec iglum pogehdbe mpl tedy dy main Abitti sea tass d tabes th t

rounding fibroblastic capsule Cellular and ti sue reactions to fibrin foam were compar able to those to be illustrated for gelatin ponte

Starch implants could not be identified by gross inspection after the roth day. However the prepared stained sections demonstrated pink colored fragments of starch through the joth day. No semificant its be reaction to this material was observed but the 40 and 50 day specimens revealed an extraordinary cellular infiltration largely of mononuclear phagocytes. The type of phagocyte that usually engulf lipoid seemed to be attracted by this material invading and replacing it.

The physiologic re-ponse to gelatin sponse whether introduced wet with thrombin or pen icillin were the same

Gelatin ponge implants were observed gradually to become gelatinou and tran par ent in appearance a they dimunshed in size to tendency to encap ulate was noticed. By the oth day only small transparent films could be found these contained brown red discolored areas presumed to be hemovlobin residue from the entine hed erythrocyte. Nothing, was found by visual in pection after the cith day and histology delegiteation of

any unabsorbed material was doubtful after the 2-th day

No untoward tissue reactions vere noted in the muscles subjected to gelatin ponge. There was some cellular reaction that was in terpreted as being of no greater ma nitude than usually arises during, the resorption of a naturally occurring blood clot from an uncomplicated wound.

Ht tologicsection of a gelatin implant specimen at the 5th postoperative dai (Ti ) showed the me hes of the sponge lung close to muche tissue with very little evidence of cellular reaction. At 10 days (Fir 3) spon e material was seen as were leucocytes and grain cell. At the 2cth day sponge remnants ver found along with inhitration of your connective tissue. By the toth postoperative day (Fir 3) no pome was identified by ht tolo is staining the cellular reaction was ub-sid in our experience cellular reports appeared to the comment of the co

#### SUMMARY

A water insoluable relatin base spon has been prepared. The matrix was found to be directed in thro in pap in solution and in to be physiologically absorbed.

In conjunction with thrombin gelating ponge has been shown to act as a hemostatic a ent for hemorrhages that were experiment

ally provoked in animals

In additional studies implants of fibrin foam starch sponge and gelatin sponge were enclosed in rat muscle areas. At stated interval the operative sites were recepted visually examined and specimens fixed for histologic study.

The fibrm four implants were not completely ab orbed as indicated by histologic evidence by the rooth postoperature day. There was evidence of fibrou encapsulation of this material. No significant tissue reaction was observed. Cellular response was comparable to that observed in the gelatin sponge implants.

to starch sponge could be visually identited after the roth day but histologic evidence indicated unabsorbed fragments through the yethday. This sub-tance excited considerable cellular response particularly of the mononuclear phagocytes.

Gelatin sponges were soaked in penicillin solution and in erted in wounds. The e ab

sorbed as readily as other gelatin sponge im plants with similar physiologic responses

Thrombun damp gelatin implants were ab sorbed by the 3cth postoperative day as illustrated by the histologic data. There appeared to be no tendency for this material to encapsulate. No itsue reaction was observed. The gelatin sponge pledgets provoked a cellular infiltration which was considered to be no greater than occurs upon the resorption of an ordinary blood clot. The cellular reactions were found in these experiments to become maximal in 10 to 3 days and then receded.

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## EDITORIAL.

## SURGERY Gynecology and Obstetnes

FRINKLIN H MARTI
F nde a d Magn Elto

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SUM ER L LOCK MICHAEL L MASO

DONALD C BALOUR As at Edit

**\O\E\IBER, 1945** 

# THE VALUE OF GASTROSCOPY IN THE DIFFERENTIAL DIAGNOSIS OF ULCER AND CARCINOMA

A recent editorial on The Ulcer Car cinoma Problem of the Stomach gard stated that Gastro copy 1 of no help because it provides merely the observer's visual impre sion which at best lacks the pre ci ion necessary in dealing with carcinoma It come to me that this statement i not quite fair to the gastro copi t because althou h he max make some mi takes he i sometime able to give quite positive evidence that an ulcerating le ion of the stomach i malignant When for example he see a rather lar e ulcer with ra \_ed nodular margins and a dirty bave over which peri taltic waves do not pa can be fairly certain that he i dealing with a malignant ulcer On the other hand when he see a comparatively small ulcer with sharp margin and a clean base with no surrounding induration and no interference with the pen

taltic wave he will u ually be correct in be

Infortunately a in the case of mo tother diagnostic procedures it must be admitted that such evidence cannot be con identificaner cent correct but the ca tro cong ricture I of value when added to the v ray examina tion and the clinical data. In my opinion a more accurate dia, nosis can be obtained in the gastric ulcer carcinoma problem when all methods of examination are used in a given ca e than when reliance i placed on incom plete data. Gastro copic examination supple ments a tax examination at does not an any ense compete with it. Reliance can be placed upon gastroscopic examination only when the method is carried out by an experi need gas tro copist who knows the limitations of the method the relative blind areas in the stom ach and the proper interpr tation of hi observations If gastro conv x ray examination and the clinical data all point to a bint it lesion we believe it is safe to keep the patient in bed in the ho nital for a period of thre weeks on a careful medical remmen, then reexamine by x ray and by ga tro copy and re e aluate the situation. If there I any que tion of carcinoma the patient should be ex plored sur scally. A fairly safe rule in d al n with gastric ulcer 1 to on ider it malignant until proved otherwise but I do not belie e that it I fair to say that gastro copy 1 of no help whatsoever in the ulcer carcinoma problem

In a recent lecture Benedict studied 4 proved cases of gastric pathology in an at

Benedict E B F og Viem nal Lecur C nr la Gas oson Via d P bolor cal F I g I easen th ma b - 1 Anal f 3 P over Cases Ph D 14 L Roome, on R bounty > ember 44 I p eas EDITOPIAL

tempt to correlate the gastroscopic x ray and pathological findings \text{ n analysis was made of 1 5 cases of proved carcinoma of the stom ach in which it was shown that x ray and gas troscopic examination were equally good in 67 cases equally doubtful in 3 cases the radiologist more accurate or more helpful in 32 cases and the gastroscopi t more accurate or more helpful in 20 cases. When the lesson was equally accessible to both method of examination the analy is seemed to indicate the relative superiority of gastroscopy over radiology in differentiating brings from malis, man gastinculeers. In the same report 50 case of

prove I benign pastric ulcer were also analyzed

and in 16 of the e x ray and gastroscopy were equally correct in a cases equally doubtful in I cases viav was superior to gastroscopy and in only a cases gastroscopy was superior to x ray. In both the carcinoma and the ulcer ca es gastro copic failures were due largely to mechanical difficulties which accounted for 2, of the 32 cases of x ray superiority in the carcinoma group and for 17 of the 21 cases of x ray superiority in the ulcer group In conclusion I believe that gastroscopy is of value in the ulcer carcinoma problem and that the most accurate diagnostic results are obtained when all methods of study are used co operatively EDWARD R BENEDICT

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# International Abstract of Surgery

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#### 21 SURGICAL TECHNIQUE E TERSOLE, U. H. Soin | Anesthesi

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PHYSICOCHEMICAL METHODS IN SURGERY

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#### MISCELLANEOUS

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if g Th gar tt M rell (64) Sparu h windle first used a ev f Besancon.

pres ure with a sterile dressing over the bleeding area or pressure along the course of the spurtin arter; may secure hemostasi

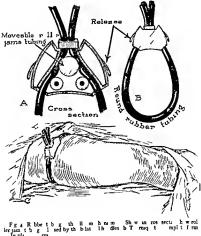
As was noted before there are many types of temporary tourniquets. A form which permits ad justiment of the construction jut they out the essation of the blood flow is de trable. The proper tension is very difficult to obtain with the Es-



Fg 3 Th hat edd th belt ed by th B tish from pe th Crumesa W

march bandage or the tubin tourniquet applied in successive turns either excessive or inadequate pressures bein the rule Ball and Ouist (12) commenting on air raid casualties in London state that althou h most of the patients with in juries of the limbs had tourniquets applied before admission to the casualty station in most case they had been applied ineffectively and had al lowed a slow steady ooze of blood These authors beheved that a firm sterile dressin applied di rectly over the wound would be of more value if r routine use. A trial at adjusting the rubber tour niquet at reasonable level above the systolic blood pressure will show that variations of 150 mm. or more are frequent Authors agree that the placing of an arrenal tourniquet at the effective tens on is a matter of practice. Also it must be re





membered that each superimposed turn of the Esmarch tourniquet has an additive effect. This is easily shown by placing a blood pressure cuff about the arm adjusting the tens on to 90 mm lig and then applying turn after turn of the Esmarch bandage over it. The first and each succes sive turn raises the constrictive pressure by 30 mm or more according to the pull mainta ned on the free end

The temporary tourniquet in c ntrast to the permanent one should be placed as f r from the sound as is conven ent (with avoidance of certain vulnerable areas) because it is often more difficult to apply and because its periodic release will disturb the wound If possible the extrem ty should be elevated before each application to retain the blood contained distal to the tourniquet though no e perimental e dence is a allable t determine the frequency with which the tourni quet shoul I be released it i generally supposed to be at half hour intervals. The tourniquet

should be moved slightly each time to minimize the local damage This interval also allows oppor tunity to note whether hemostasis has occurred which will make the tourniquet no longer neces sary Period c release also diminishes the severity of the shock which as we shall point out follows release after prolonged construction. The lowering of res stance of the tissues of the injured limb is also counteracted to a certain degree by this periodic flushing and reoxy genation of the extremity

All persons with tourniquets in place must be regarded as surgical emergencies and be given hemostatic operative treatment at the earliest opportunity Good field technique includes the administration of morphine for the pain from the arterial tourniquet and the use of care to prevent movement of the 1 mb or slipping of the tour quet which would result either in further hemorrhage or in damage to the local tissu -s

I last point concerns the desirability of refrig erating the extremity distal to the tourniquet

TABLE III - TOURNIQUET INJURY OF THE NERVES

(F m Eckh fi 93)					
Age tes	Operat sa	Paralysis	Rec 7	Anesthena	Reco Ty
1 5	FI Dig I	U Med.	TF.		
F	Flex Dig \	UI Med	3 20	mb ha d	5 200
F	ET Carpured.	Rad	5 m	ne	
31 1	E Rati I	Ul led. Rad	5 M	T gl ng hend	2,
F	W ng. Hum res	Rad	6 m	Doubtful	
21	Pla Rachus	Rai	m	Numbba d	3 da
1 5	Ex Fragm Hum rus	Ul Rad.	to	Ttall re-	wk.
M ?	Ex Crst.	Ul Med. Rad	m	T tall #~	3 da
F	Transplant, Ul	Uln 31 d. Rad	10	Totali re-	ds
13	S Brach rad T d	th Med. Rad	śm	Det .	_
35 6	S FI	UI fed. Rad	V m	Taline rea	٤.
VI.	P! ng Rad us	Rad	3 10	T at t re	.m
-	P ng Radius	Rad	70	Hand	4
71	Op Reduc Elbow	tl fed.	to o.	T tall re	m

The interval between deflations will vary with each case but a half hour interval; safe. This is also true in pl at e surger; in which the tahlity of kin flaps is questionable. The safe period is and to be profon ed by packing the burst hours and in the limb and irresting with coff saline solution.

Th I ngth of time the culf must remain deated to allow reexy enation of the tisses has not been determined nor do estimates appear in the literature. Three minutes a reasonable time Shorter periods would not allow dequate exchange between this interediblar fluid and the blood. A lower wait would poin in the operation unreas in ability.

Ele at on of the extremity before inflat on of the cuff is or unimar. As a result the venous oze dunn it operation is decreased and a certain amount of useful blood a restored to the circuit tion. Pr loaved ele ution brans about a ph suchoreal c impensation with association which cancel som of the guin. Too brief a period of ele viction does not allow maximum fall of the enous pressure. Three minutes a cneralla ce pried as a reasonable period.

TABLE IV - NERVOUS TISSUE SURVINAL WITH

Small cortical pyrams fal cells	8 ma	Gorse ad P'k ( )
Bras has Leensesta son	2 mi	Viye ( )
Vetst.a	E0	Go 1F1 1
p lgangt	3 m	Com ad Pik (34)
pinal co d	bou	Eh ! h d Brege ( )
Sympathetic gangl	hou	7 1 1 1
Merc en pierus	t hours	Canno ad R k (so)

Following this period of elevation the cuff should be infisited rapidly to the proper pressure Hesiatton results in venous stass and engagement of the distal blood vessels. Infistion is often the dust of the anesther it who is not aware of the necessity for decisive action. He need only allow the pressure to stay for a moment below systolic blood pressure to distend the blood vessels. The use of the long that Esmarch bandage in spiral salmon to express the blood from the extremit before application of the tourniquet is helpful but usually levation alone is enough.

The fifth and last facto which limits the dur ation of the use of the tourniquet is the effect upon release of the tourniquet. The restoration of the circulation is accompanied by a fall in the blood pressure (10) the degree of fall depending on the duration of the constriction the condit on of the pat ent and the am unt of tissue rendered ischemic Chart I f om Wilson and Roome (56) shows the cust many effect. In this case release of a tourn quet from the the hof a pat ent after two and one quate h urs of constrictin resulted in a sudden dr p of 3, mm H in blood pressure This drop must be av ided if the patient is in a pre carr us cord tion. The pres ure rises are n then of wh fall to sh hth below normal Table ! also from Uilson and Roome (56) shows in d " the relation between the duration of the con tric tion and the incidence of death after release With less than three hours of constriction pore died whereas with mo e than six and one half bours of const iction all died Table VI shows the effect of arrous f rms f treatment on the shock produced upon release of the tourniquet Wish out imputation all dors de If the teatment con 15ts of amoutation and blood transfu on the Blood al ne does r t sa e tremnimal recov Blalock (13 3 ) has shown that an a era of 24 per cent of the total bod we ht remo ed as h ur interval res its n the death of the dom in an a grage of twinty-e ht and one half hours. M lon et al (43) obta ed sim la re sults on r lease of tourniq ets fr m the hind fegs

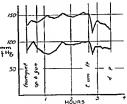
TABLE \ — EFFECT OF DURATION OF CON

	(F	W ls	d Room	936)	
\umbr	14 29	Du	1 ns	I	1
		<	sh rs		d d
		3 to	6 b rs		<b>d</b> d
		>6	h rs	A	na a

of do s. The rather direct relationship between the amount of fluid lost into the constructed or traumatized leg and the development of shock suggests that the phenomena following release of a tourniquet after a long period of constriction are due in the main to loss of fluid from the general cir culation into the extremity because of the in crease in permeability of the capillaries due to the ischemia (53) The application to operative sur gery is obvious the period of ischemia must be limited and the ischemic area must be kept as small as possible. When the cuff is removed the pa tient should be watched carefully for a precipitous fall in blood pressure and he observed for a later gradual decline in this pressure Patients who are in or near shock should have tourniquets applied for short times only with frequent deflation of the cuff As Davis (22) stated We have had an occasional drop in blood pressure upon release of the constriction and are familiar with other in stances in which the patient develope I prof and

shock immediately after this procedure. The danger of shock and of damage to the tis sues rather than injury to the nerve and skin or gingrene is the limiting factor to extended applications of the tourniquet. Four hours is a safe periol to maintain constriction in the operating

room and should cause no damage Effect upon the local tissues by the cuff Local compression of the tissues is effecte I by two fac tors the sadth of the cuff and the pressure of the cuff The desirable vidth of the tourniquet has not been established Allen (7) advocates a nar row tou mig et but does not take local damage to the skin sufficiently into account \ \ \ wide tourni quet on the other hand distributes the c mpre s on over the unequally yielding tissues a d does n t cut into the skin I agan and Bordley (47) have hown that a narrow sphygmomanomete cuff gi es blood pressure readings which are too hi h It f llov s then that it takes a higher pr ssure with a narro cuff to stop arterial blood flow than with a wide cuff and so the nar o cuff lead to greater damage of the tissues This 1 5 pported by the work of you Recklin ha sen (48) and of \orrisand hi co Lers (44)



Ch tI Effet ft magetabotthghoth blood

The factors governing the pressure to which a pneumatie tourniquet should be inflated are often misunderstood yet are obvious in principle. An arterial tourniquet is used to stop arterial blood flow The level of from 240 to 260 mm Hg most often used was chosen to be above the systolic blood pressure of all but the most severe hyper tensive patients Blood may escape under a cuff set at 240 mm but such pressure is not needed in most cases Lahz (38) who alone discusses this question believes that from 10 to 20 mm above the preoperative systolic blood pressure is enough A different conclusion is reached from a study of the blood pressure records of 137 consecutive operations at the Cinemnati General Hospital 100 of which were performed with general and 37 with local anesthesia (Chart II) The preopera tive systolic blood pressure is charted against the rise during operation above the preoperative level

TABLE VI — SURVIVAL AFTER RFLI ASE

	(F m Wlon d Roo	DER 1936)	
Duration f Cons rac (hou )	T m	5 ) 1 (bours)	W [ h 1 (pe )
	Blood ad ous	-6	7.3
	Blood di ve nus	,	
	Plasma	3	6
	Plasm ad sal ne sol son		6 5
	Ampu son hours release blood	Recovered	
	Amprits son bours of rel are bood	Reco red	
	Amputa so hours 1 release no blood	,	
	Arapa tion hours at certel we no blood		

- 3 Garx so FH An I trod to t th Hist ry f 45 P rz M La Medica 4th d p 75 Philad lph WB 45 P rz J L 6 d rs C 0 0 8 87 49 Pent J L. Qu ted by C J 5 Th mpso (5 15
- 8 87 C ٠<u>9</u>9 34 GOMEZ L dPreFH J Exp V 900 t 57 3 HELL DO US Quitd by Leo d (30) P 5 36 H Max S J B ros. Shock, Would Heath g d V s-R. c. đВ J III B II Jh Hrpkin Hosp 94 60 504
- 48 RECELLY H Arch rp P h L
- cula Inj nes Pp 99-20 Ph lad Iphi W B 90 46 78
- 49 RETMER C Ch rurg of
- S unders Co 943 37 J H SOV GS d BLALOCK A. A ch S rg 93 45 I t mat 15
  - S rg (5 r Gyn Obst ) 94 7 300
  - 6 5
  - RO B D \ Zeal d M J 933 3 3 SHARPE SH ER E Brain 9 7 5 538 S & RD E S Lect re J has Hopkins L
- 38 Lauz RS Med J A tral 94 465 39 Lo 0200 RA Hist ry I S gery Pp 5 5 5 New Y th Froe Pess, 943 4 M vr. F VI South VI J 944 37 4 M vr. Ned Zbl. 18 8 6 5 9 Qu ted by Cann School M School M 7 of 53 Swingle W W R M TO JW Klet's
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  G GW BYEFT HC d WCM LLA TW
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  - Philad lph: Lea&Fb 31 334

## ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

#### HEAD

Woodhalf B and Spu ling R G Tantalum Craniopl ty f r W Wound of th Skull S # 1045

As res lt f the l ge number of crans lanjuries a tane lin the pes nt w r interest in treats g the oft n c neomitant er n al defects has been r newed Se eral new methods of cr n oplasty which ha ap pea ed in the past f ware is include the use finlas to riallum and tantalum Of these tant ! m has become the most p pular becaus of ts me t nes and the eas with which it may be handled. Al though methylm thacrylate and vitall m may be equally mert the f me has recei donly a l mited spol catio and the latte more diffcult t use a it must be east

It Walt r R d General Hospital Washington D C 70 pat nts had tantalum crans plasties n a pen d of el n m the and one half of th m w r
ret med to d ty In th Army the nd cat ne f r
cran pl sty a e im la t thos in c vil pea t e e ceptfron tem— the 1 my r gulat a t testh t s ind v l l ith a cr mal defect of m e than 3

uld ft tm le

dameter r v not he et rned t d to In c il p act ce such small d fect

c asidered flittle cons quence In the p esent r port an imp fth dfct s made of s ft n dd nt le mpo d F m th a mod l sf med with d ntal stone pl t r nd the da d cont is f m d tha Am ld f the a aismad ithans of them ld gs dade hi coutraye 1 pard ith z co had mte The plate is s dg d nt shape by I ess e Lnk alfre sb el minated by hamm pel hed pl t with ngle hole 1 th 1 ter! d an aut clay

The peration wullic dutudrl 1 a esthes a daft pemdcato wth mbtl morph ne a dat p I deated to teal es c tn and I ral r pars carried al dg as f med in th bone edg Th pl t was thin trimmed with hear) or is that the Ponts ft nt lum Pe lin as do nt alls d locally pot pe at 1 f t conte d'after the 1 tituti n of th 5 g m

Th two tagem th d fobt ng d n ith dictatth tal pe to mo appleabl in c lan n ug ln caes the ned of ft ec plats wild be zed a d the bo dgesp prod n imper on wull be a a lable the cod per t n collibe car dite pedt h in cell t suggest n is the ins t n ft tal m f l t th first pe att n to pre ent adhes ons between the calpft pand the nderly gt es

An lect neephal graphic study f the po sible ff ct fcranioplasty upon a convuls v state was car red out a 6 ca es These w re select d cases con trolled by a nservative tre tment. I wel e ca es showed no ch nge in the lectroencephalog aph c patt in a showed an imp a m nt in a prevously ab mal c rd and a revealed an nereased abnor mal cord with the de elopment f p leptoge c I CK I WOOL MD

Pugh D G Fibrous Dy pla ia of th Sk !! A P bable E planati n i Leonti sis Ossea

Rad 1 gy 945 44 548

Lesio s f the skull associ ted with p lyostotic fibr us dysplasia (Fig. 1) have a characteristic r e t log cal ann arance Fibrous dyspl sia f th f the sk ll occurs at t mes w th ut hylou av I ment of the remaind of the skilt therou dysplass of the bones of the skills fu d entg I g cal e am at o of the entire klt huld be ca dut In mot cases it seems pob



Fg P lyostot c fibro dyspla is. The pat thad typical fibro dy pla is fim ch f the k l ton.

controlled treatment with thiouracil cleared up th

condit on Fibrillat n and cardiac decompe sation n th thyroca d cs were noted in p te ts Compe at on with normal sinus rhythm was resto ed aft six weeks and ight weeks respecti ely fth urac l

The e was une pl 1 ed instance f resistance to

th urac ! The d ta prese t d in this report demo strate clea ly nf or of th our acid as the g t f cho ce m ind cing a d mai t ming a state f rem s m i pati nts with th roto co s

M THERS I SELECT M D

Eri h J B Th Tre tm nt fExt n Cicatricial St n i of th L rynz r th Trachea A h Path Ch c. 94 41 343

Et nsix coat ic I teno s of the large r f th uppe part of th trach a usually can b tr ted most succe- f lly by an pen perats n thr ugh an inci on in the neck with di ct exposure pe mits accurate cuon of the thick n d car tiss produe gth stit re

In the cases n which this pecise in the dofr establish gith n rm ld mens no of the larynge l or the tracheal | m n is to be employed ti di t noth ad antageous to do de th c ree f treat ment into thee ep rate stages (1) the urgical re moval f the cicatrix (2) th m chanical pr at on of a t ad ac; towa d narr wing o constr ton of th n ly m de l men ( a long per d usu lly s m nths) and (3) the plast c closure f th ex t rnal tr cheal open g

The difficult es which are in the cale f patients d ring these three stages of tre tment which a e discu dats m length are du n tt the nt f techniques which a capable forod conger dishle results but to th dof mpl fedf rm ft eat m at with f wer amoving t cha cal d tals and

f w operat pha es The uthor ha d el ped plan of theraps wh h n he experience is comp rate h un n ol d which is greeable t the pat in because t e ther causes d scomf rt nor q tes any f m f bryng I examinat no man p lat on during th pr l g d

co dist ge of te tme t nd wh h has p od ed grat frin esults in high percentag fh ca es WDF : TND

Harriso M S D se e of the Cervical Spt t Larying logical Practice J Lo Oil Lo d 945 59 391

Three cases of ds se f the crucal ph are described In an steparthrit's f the cerv cal pine with mirked hpps of th vertebra produced a p chis feel g n th thrat ns allo gandst ff ness of the neck. The 1 pp ng is d m nstrat d on r nten ram

In the e descot omilts fthefurthad fifth cers cal's reebrae d's I ped with a sudd n set The 3mptoms first appea edd ring at g 1 ule ratin granul ti g les on wa see i the ght p ni rm io a ju t bel w the le 1 f the ryt 1 ca tilage The les on f the s t hrae e demo stat d by roent n gram Epd rale te on s I deated by ensory ndm tr hanges in the pper and lo er limbs Treatm t a carr dout by eck fixatio with pl ster-of Paic Il admicto of pen callin occurats enyfuh is for sad is a da fort ghtlt raf ithe c rs f furd ; w tha good result

The third case we that of a negrar-old child s n na nati h p tal \ ge Th pat ent had a e o throat | a f w d y prior to thee et of the maked t rt coll sc | s f the erv c l e gin and head fix to Sme alnes fth ppe atrem ties was prese t A pla te of P n h imet was opled und an sthesa with tract the from fo twelv w ls and sulfa 1 mid w sg v n rally

The cryscal rechrace are a less I equ at a te! osteomyel us than the I mbar nd d real ert bra The major ty of cases re h matoge a small number ar d to dre t infect n I om a infect ou p ocess n the pharyn Th taphylo-

ab cess is a c mm n nd it b sees may be prese t th pot in gle the neck or post is ly the gh the cervical mescles. An ep d ral sp ead is mmon with be essift mat a diseg me t lp raly is Jan R Lidea M D

### SURGERY OF THE NERVOUS SYSTEM

#### BRAIN AND ITS COVERINGS CRANIAL NERVES

Koz i H L P traumat e Pers n lity and Psy chiat le Seq ela f Head I jury Lateg Ical Fretra matic P rsonality Status Corr I t d will G i P ychiatric R cti n t H ad I jury B d n An ly is of 200 C 4 h h P j h i Ch 045 53 358

The med cal profession and especially the psychia t the long b inte sted in the f ct that c r tanpe sons develop me t ist t safter he d n) ry bile others do not It was Symond ho said It n tonly the kid f b ad jury that m tt rs but t cl Irom the N the ki d i head Th gical U t f the Boston City Hosp tal is ne of a enes for rel ted; we tigations on the matter and will de taken by a team fineurolog t pychia trists social rk rs d an electroenc ph l g raphe Tw h d d pat ents we sicted i m 430 those u d fifteen and thos ov r filty h ) cars of age ch nic alc h lies and th b scalls nemploy deee cldd The type fh d jury s staned f co rse dbtam gth cace were 46 w th blood t ged pn iff 1 34 sk Il f ac i res a d 14 ca f foe liniuy th localiz g n ur log cal sig n other words a rage g p of cases seen 1 th be di jury ward falarge c ty h ptal

The va ous p ychiatric def iti n d lmt saen tol spelitrestt a sone b tapsy chatr t b ta adequate sch me fa ses m t used Cetı sed Ceti terest g fils we mogwhich was the lack ico lat nb t traumat e psych at ie symptoms a d p st t um tie psych t c symptoms L s tat d th t th h story of pate ts of val 1 estim t g th pe tra m ti p onal ty Th s was not b the st is becaus f 146 patie ts with h st ry 63 pe cent hai pott aum t me tlsympt m whl 37 per cent h d such symp tm Sym nd dRuselluedth tmpd co ct th p tie t h cul t pers alty rwth th se h a t pes idapsychat chst y I this g p the e 8 pr tdffrc 1 fa f such persos Th ws howevr a subst tal c las nbt n the e tence of it g t d I pme t f p vehiat seq I Psych I g cal fact rs had a d h t bear g th p st tra m t c rt tal sympt m V 1 V 66 v M D

Fiw LT Pillin A An Adjecto Srgry
th Teatment f Brain Abes AR potf
6 Ca St A J J 945 38 3

The auth report s es f6 f tracra
ul b c tr ted at the U stel St te \ all
p1 I Sun D go Calf rn Th 1 th g g

isma obta ed from cultures w the streptococcus 3 caes d the staphylococcus in 2 Ther ere may t log cal factors pres t f tal sinusitis preum na w th pleur sy t t s medi ith mas to d tis (3 cases) a d a comp u d d pressed skull fractu

The v l l penicillin san adjuct in the treat in told ban be as so sho n however it is sit is d that p icillin is in n way a substitute fo signal e acut on of the pus. It may ho e er alte s mewhat the mode of attack. In the present is registered by do has g it any this apparat in f the put while the other ship of partial parameters of the property of the control of

Although th g eral systemics act nt the nfec tion was imprived on pin lin the apy as evi lenced by the subsiling fever nd by a return t rm I ftb lc atels hite cou i th er a ed in tacran Ip re w thais c c m ttant s gns wa l eloly ft a at I the abscess Pe cill was ot njected at th abscess cav ty aft ev c t but was usually admin strdit mu cul ly v ry thr h urs \ total d ly dos ge of fr m 8 00 1 100 000 units \ as used Recently the d s ge b s b 7500 u is daly in f ve doses f 5 000 un ts a h I tr th cal inject ons have b had ned f cent evid no has sho n that pe i cll enters th p I fluid J ck I Woolf MD

#### Ti kle T G S rg ry of the Fach h rve ln 300 Operat d Cas L y p 945 55 9

This short in the describes the all thoris technique d tesults in 300 cases f fa lp ralys per ted n s nce to 30 T o typ s ff c l paraly Fe T sponsi e t su g ry on res lt g from ju y to the rve d the so call d Bell p lsy When the nre ij ed its d tal ndisid nt f daft r the t p f the mast id process is moved this is f l I wed pt the t ju ed part of the nrewhch : £ d The health) p smal part of th al ers s d nt fi da d the l ngth of th g pisn ted in anterior cutaneo b nch of the femoral ners f app opriate | ngth s ed to b idg the gap N I rm I gle i empl v d to jo n the ends no i anv s d A gold leaf d es ing is ppl ed an l this m st be car I liy ch ng da ds perv sed

For 1 tents with Bells pally who he clost the responent net frade court nit the decompers we operat in the litting of the history and the semply defined in the semple of

was in the al colar walls. Oppone ts of the theory hold that these neoplasm an a from a s n le focus probably not a sill be ochus and the metastasize rap dly to other parts of the tu=sb vay of down growth in the bro chall it e and by extensing throw by the pores of K his the Numbhate's and the bloody as tu=sb.

I sp t of the argume tal po t the authors be le these reported as es diffe s from oth f rm of pulm nary tumors that they should be men sue

cial cons dirati

The majorty of al cola-cell t m is ar mal in but some ae ho of l e rhistol oscilly be ign Sms B il Talk nd \( \) ck som eported cases probably f this charate call g them blat eral multiple pulm nary d matosis erte sie dif e pith laist on of the al col and p l mon ry, mucous epithel i byperpla ia The th d case i ported bere was somewh t a mil r with a lower grad f histol cal m lgalancy maked muconous sect n and abs t region land dieta t

methalases
The clin cal f tures of this tumor r s m lat to the rlu g t m rs eg cough bloody sput m pan n then that pleural eff so a d cannons. E en m el t els b ngn tumors the utcome m y b fatal beca e f them ol em nt ol larg 1 g a eas r sec dary mil ct u p occases. The pognosi then s

unfa orable in the v rwh lmn maj ty of cases
lthough lateral or m n lobar tumors may be
am nable to surgical o x ray t earm nt

M cop cally these t m rs consts of an plastice columna or cube dail ep thetal ells that he is the ell per erved all col wall a d fram w k. The cells ofte f m papill ry prige is. W tosen are p esent. Occas on all b nch revel ests it tumor cells in the s bm coast. Thromboss inflammation and ea ly abscess formation re old in se. G ant cell fragment d aude and desquamat in it more cill i to the all colari in an are seen. This implies to ecosts and contain timor cell. Pe d tratification and mu in sscreto a ecommo M rhed fibor of the intra van is is, tis use m y be h will column a column cophages a d le constite.

Fom the r ten log cal post few the proten ppears of the alcolor-cell tumo m kes the difficulty for cls edugnosus end at Tho cat go log cal ppears ce may m lat bronchogent caim m tastat tum r fungu infetio o poseumo Lib i occalication or cavitato e cite drect res it fub tumo and confise to m petr of 0ft no compleat a harm no a ocato with the timo shape in m to troubess lead to further difficulty a may

d agnos
Clinical for rs such as lack [ ] loss is
weight procress; weakness da hrom to rie
may te the scales in [ of tum diagnoses be
as frasal rela cell tumor fth lungs is co ceraed
the diagnoses in the majority fear, each eight of the
realm fithe ray differentiate and each emade

only by m croscope ex mi at on it we a pate ts with multiple nod lar cemi for tattate shad we without e dec forman to release where this time reshould be superted the release of the rele

Jackson C. L. K. nzelmann F. W. d. Nris, G. M. Bronchl 1 Aden m. J. Thorac S. f. 945, 4-98

The auth is nire e there ew gith a record f n d 20 cases typical of the cli cal and n tholo cal att V Lnown as b n en adenoma of the bro chu and they present the est alf the softhere est and they present the service These mot magent allo h m ptvs sand c uch often prod et e The ent e n gram w 5 negati i al w i tances but e n erally h wed b tructu atel ctass a d occa n ally effus on The ages I the patients ya ed from thirteen t f rt four years nd 80 per c nt of th pat nts we women Bro ch scon c hi ns wa done in all I the cases but the t saue wa by meaned arm ede recells the first t m th sld w s x m ned I fet it w s q te te esting t not the arm dagn es m d by differ nt p thilseists and on diff rent occa i ns by the amen th 1 gist for many of the cases The authors bel c that they have m d s me p og es t wad mpl fun and stand rds. the crate fire errors and pese tth r rtcl with thi i mind

Name us co ir but as to the re ent it catur ha e tend d t cause confus o m ng pathologails a d su geo s l ke eonetern ng th b tol g cal structur of these tumors Bronchial d om sh wa neculia es the lip lil rat men ally reco

r troma

In cells a cobo of som tumes encil m sms ged as a | g| y vario lyst d spaces. They may form two or m relay reo full flat pases. They may form two or m relay reo full polyhedral cell and the may be ppent for life or croul time. The cell fit are so if y pa ked that ext pl smc times a cun er emable 2. The clear rund or onl d whe life the year of the property of the companion of th

3 The tuma coree es som times as denc i by den ty tibros with shir king it in clisa d pick oss if the nucl time it are the haped stain blich ick a dar i sely pack d

haped stain ble e hick a dar I selypack d 4 Occa ally the rapedly grow g t m is the eldul pattraish tso le

5 Som t mes p p llal ke m es are c ther as I d cords feell rw th the p th lum arra ged o th sd f blood ess! These o c tan look! ke th pseud os ttes en n t m ra of

th rous syst m O is mp es ed by the co tance of siz d hap f the n cl ept when

r gres n has occurred (F )
The st mass ft n dens nd pon 1 c lis wher

regres. has occurred b t f q ently t is not i

or lames and shows interst t al b morrhages and publishing hobbasts are found to in a de the clot at derivation the tumor m ses. It may be that these fluo s g m this which prom te regress in the discovers a cas oft n contain hemos derin depos is where hemor heigh has not occur d the cap llar es will din a dout around the ac us lke struct residence in the contain hemorrhage the substitution of the contain hemorrhage is the struct residence and the contained the

Ra by th active prolife att g capillary doth lum hich may sho mito es will confuse nd lead toane cou dagn s Tb auth es have en co tered bo a deart lage in et mor but ne e have they found prolife att g m sele cells. It is be leved that these is sues a e incid ntal a d not a

true part f the tumor

The state of the s

ngcells Thre is no evide of metastases cand by the blod or lymph at earn It spossibly these through my become making that the authorship are seeming not change occur. Diagostic accuracy did not the nath logists a sense the

curacy dp d on the path logists s eing th whole pctue th refo e the ent e tumo f small ornumem sf gme t if large sh uld best ded by

senal sect s

So the climical pict may only b suggest to the final of goods in the cases may be mad by be choicepy with boopsy Needleb ply so dade of a mall obsectionly and per me cet my shall a rehavet be donet establish the dag size the strength of the most strength of the most size of the siz

One the diagnoss has been made se eral dd thalb choscopes should be die tor leve bent he lob truct on This is accomplished by penmel freeprome 1 by electrocoagul the oral ombound in 1 both Elect agult prodects 1 stolled angades safe admore fifteen the mottes the Theauth's free froud ut me advant get at 1

tenatef ceps emoval ith lectr co gul to.

Whe th tum can be remo d b onch scopic
ally there gead react in of the ditail bro
the litree meradical treetm timas be postponed.

All pat his shild bk pt und ob mat nad
treetmed tit rival semiliterim.

The anthors believe that his grescetion is not cated (1) cases of bunnehal ade oma in which becaus of ses 1 attachment and size by choscope rem val is not feasibly and (2) in cases in which cavitation be choscope or other severe demage to the dist 1 port in of the lung bas resulted film prolonged bro challobstruct on

Very diffe in stuation obta s in the case of bro chial adenoma the in the case of careinoma as far as ure e.y. is so eemed provided drainag and ae atton can be re established. The ade om a is slow grow g d es not metastasize and does not have y1 herent tendency to become mal gnant. A y co trary opinion has been duel error in h stopatho

log cal diagnosis Ros TR Bicelo MD

Graham E A and W mack N A The Probl m

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The so called bronch al adenoma is now known to

be a common tumor with vell recog z d character ist es It nearly always occ rs in a primary b o chus r cl se en ugh to one to b v sualized by the b on cho e pe At lectas s of a lobe or lu g is common a d n t 1 f quently the bronchial bstructi n causes an as cated by chiectasis Wom affected slightly more oft in than men a contrast to the prep ndera t male inc de ce of carci oma Usu ally the ymptoms apper arl r than in ord nary ca c oma e en s childhood a dad lesce ce b o ch pe pict te is typ cal showi g a smooth ro ded p km ss w tha bro d b sep jecti ginto th lumen f the b o chu Often only sm li por tio of th tumor i e dobronchial most of it being uts de f the b onch s Ulceration is rare even th ugh h moptys s is a common symptom There se ms t be a st o g associati n of bronch al ade nom s w th othe c ge ital lung abnormal t es such absent int l bar fissures or excess v l b latio c gent leyst cdisease or abnormal b

The is i lyd fi ite microscopic pattern The tum e is cord the bronch al epithele m which ofte show sq amous m tapl s Directly beneath this the is a fibrous tis e layer of vary g thick ness ft edem tou The m n tumor mass con s st feell with sea ty cyt pl m nd small round d kly stagg ele with ramitoses arrane d sml rly t f tal pulmo ars al coli Thes | beol are s parat d by a stroma of blood vessels and loos edemat us fibm t Thee lls re oft ne rd I ke and the sastil g smilarity t hypern phroma which pr bably accounts f r som mislag n es When the stroma excess ly vascul r th t mor ppears gomatou d t has oft p h d theloma In som tum rs the d gnosed as a trom b heen dm ted b mesobl ste e lls with the resolution to as fifth 5mooth m cl f t fibrous a d hyal ne cartilag nl ven bon hav be een I th t mor secti s f m d f fr t reaste 1 ery differe t ppeara ces

The triking resembla of these turn rate fital in gas aggests that they may be do ned from doo

gan edembryon ch da whi hha ef iledt de In normally or hav atr ph ed Thef that these ad nomas have m n) ch racterist es l'he the mixed tum is of the sal 'arv gland led t the authors calling them mixed tumors of th I no 1 038 These charact ristics a e the p esent of cart I ge or bo e the t ndence to in oke n hborn tis ues di ectly and th occas I t m formate by the connect to a ssue elements. Path logists mi ht quest on this last charact usice but th authors be leve th t many cases feho dr m fibroma l noma myxoma a dev n sarcoma of the ng or n te m the so-called a lenoma or mixed tumo of the bro chus but in which mesodermal leme ts pr liferate with the corresponding epithel I prol I rate n

groups of pulmonary tum is can be th ught of our iring because of fair if a br chall hal to delop into a norm I ad It arm gement of it is included in the groups of the control of the con

In acc danc with the 11th is id a two man

tumors

The chief in cal problem concerning these tumons with the they a a tually o potentially inva v II on accepts in as n of the di cent tessues r go all lymph nod in obvenient and dist it means as circle a findingment on the lift I con deable experience of cannit digit that there have been cause; which the tum is beam mad on the contract of the contrac

In 938 the auth rs pnn was that these ad noms wer pote tailly m l n r and they e p cted cases n which in as n l th adjac nt t sues or in ol em t ft h reg onal punph nodes occurred Kirch o Pen Vi lkw tr And 1500 Stowell and 3d m st nner and Block I have ported cases of m Igna t cha ges in 30-call d lun

ade omas

The auth rs p ese ta case wh h and noma had pursued a b ngn cours for mo than twn try years before the cam m I gna t Aton tim it appeared that the t mo had been complet hy moved thr gh the br cb cope but an tn. carcanama with it er m tastas e thally d el ped

An there are speed a min bland mass f a min ed brouchaid i more by the definition of the bland elements we shad the who discovery A that p eum nectoms we shad the who discovery A that p eum nectoms we shad the who discovery A that shad the shad that the shad that the shad that the shad that the shad that the shad that the shad that the shad that the shad that the trachesborochaid lymph nodes at d er was fund that the shad the case s n xample dand as with metastases the tree nall lymph glands a d live Theye opectur that of that beens nearly b fo e m tasta es de el ped t uld ha e been called a benign aden ma f th bron hus

The fi al ca e presented is of an ob truct ne ra 1 lary t m r f the right uppe lobe bro chu f nlon bronch scopy Th pati nt underw nt a right total pne m nectomy and re s r d Ol great nt rest was th path I gical pe men s e gro x m a tion re led n'e idene f tum rin the dia e t Is mph nod s The m cro cop c ect s sh wed 21 e trem ly bizarre mal gn nt tum r of th lune in wh both pth | I nd con ctiet eliments wer taking part Ahn I d gnoss of mied bo chorente ca e n ma and sarcoma s m de Th a thors ble ethis to b an utstanding xample of am I gnant transf rm t of tumo which il se n e ri er would ha c been called a br n h al ade oma Mo e ante est g is th f ct that both ep th lal and c n ects e tiss e elem nt h s bec me mal en t whi h is support for the authors theory that e the the atod rmal or mesod rm I lement of a I t at bron had b d may take on th f t res of a neopl sm and th t e the type of elem at may becom m I mant The presence of bone in this mix dear cinoma and sare m supports I rth the u e of th t rm mur d tum r of th bro h s

This turn is hen first as are sully four I be being and a me of the and visuals ha bor in them my I lift their normal lie spa the tumors is the un unaised in the term of the time sevide ce that a patie is ha is disamptioms from such a tumor for their ty sears it; a rate to find a bronchial ade in at aut pay after midliage. There also no this probably less it is fet that the mi, it yet of these turn is become milgin at and often lost the in all dist if it is supper a ad anoma of the bron hu is uld be mely foil wing the rule of what is illestabled in earl of or all the distributions of the state of

nomes of the best prestate the ode deect m In new fith will establibe im lims topot tial t es rad cal surg cal emoval s cles ly th p ocedu e of ho ce Broncho op c rem 1 rar ly could be c mplete becau e I th fr qu cy with which lag pat f the tm I o tide of the bronch s Th r 1 th ddt lh zard f bro ch al perforat a wth b h cope emo i If the t mo is a templitely rm ed the rm in t may late becom I vas v An the bj et local rem valus the c rtanty nm ny ca es st wh ther the turn is actually mal gn nt t th t m of op rat n Tasue m ed by br n hai b ps may n the lealy mal on nte n wh the tum r has all early novaded ghborn g t s s gr lymph nodes B boscop rem v 1 m y be satisf ctory al o b can e of th oc ated br n h ectasis suppos dly d e t br neh al b truct th tum r Lobert my will om t mes be ad q t but becar fith leat n fith tim tal pa m eet my will m r ft be ecessary This l ed e nal lymph r ced e by wh h

odes can be remed meeally nd which good risk pite is is ly lihily med x tha lobectomy Rext R. B. Low M.D.

Bioch R G Adam W E Th ration T F and
Brya t J E Difficulti in the Diff entil t
Diag osl of B onchogeni Carcinom J
Th & S f 945 4 83

Recently the inc asing inter st in lu g ca e has led to much improvement in the diagnosis of p 1 mo ary t mors With bette x ray technique and bro choscopy the differe tit in from other l g miol ments has bee me comp rati ely easy and f wer pati nts with indobr nich al cancer die hi cause of errone s d agnos s With mou t g experience in the many cl cal and patholog cal va ations of such t m is and esp cially ith the desire for ea ly dis co ry t is app r t th t a con derable number can not be definitely recog ized by cons rvative dugnost c m thods La ge scal rout e z ray ez b g uning t show an 1 crea amin tion number of sm Il find nes of do btful s gnifica ce nd origin but it is hoped that when these exam ation of supposedly h althy indi luals b come un real there may m g a preponderanc f s h le ns

d nes now being seen orth far d R t e hest flo seoty a cas find g pogram f r t b reulosis t the U raity f Ch cag Clinics h s pr d most h lpful the d sco ry of nont berculous chest inv 1 me t d the th rs bele that the pr cedure uld he ; til d fo the sole p spo e of u c ering ca d s scul d ease and t m rivl me ts Of 15 000 p tie ts 9 or of percent we for d to h v t th plasms O e third of these we lass I d tatic gro the while o ef urth well and gno ed as primary br chog n c careinomas It is t est ng ton te that one half I these ca es re s g ed to claucs whr phy cale amin t as p ted t I dto the dagn sae t car d ut I'h

whelm ganaj tyof pate is with early tom lo not show any bye alf id gs d m st fitness patents had compla is u relied t it chert Among h sp tait d ac as pulm mary tum rs ha be f nd which c ld tl conn t d sith the patt thistory Ths has b du largly the fitthat ceasignumb feb stry a beigtstin.

The fet that crasng umbers f pat tace be gas and by mp or dry great thin p loe be gas and by mp or dry great thin p loe be gas and by mp or dry great the great for hydrogeness further than the great for great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for the great for great for the great for the great for great for the great for the great for great f

If arly rei in lke t b c l s d es t ol e la g bro h l leme ts t s n t lk byt produce ytoptom f long tm l t does th var so mild and i s gn fica t th t th y lly

disregarded by the patient. Roentgeological eammations often will not different site them from small tuberculous or n tub cul us i flammatorylesio s Early penpheral les ns constitut 3 per cent of the t tal lung tumors and bronchose py is always negative in these carcinomas. The pred agnostic history of some of the cases illustrates the se ming nisignificance a dobecurity of early carcinoma and some of the problems in more adva cedlesions when complicated by unrelated of sease

An impressive number of symptoms and find gs have been described as those of bronchogen c carein oma but thes should not be taken as typical and tainly d not pply to a lyperioheral tumors. In

Schnid L. a dR i man I i ldi p thic Spon t n u Pn m th ra llistory i 100 Unse I cted C had I gy 945 44 485

The reesh be aumpres dby the freq eyenth which as be ty a spontaneous pn umoth a sobtain df m slct es fr m 8 to 38 y ars old who appse ed fo duct n same at n About r a soom ng eav r 6 d history of the scond tion lit to-called dip athe spontaneo s p eumo the rail by r solls in pulmonary r be culton in the sound be not be not be not be not be not be not be not be not be not be not be not be not be not be not be not be not be not be not be not to the not be not not be n

The thrs bel that these cases should be tr tedlk the aced nist hy e lly are Once the patent has recorred not he more shous will a ppen then possible recurred of c llapse after which as a rul as be quentiatek; u comm n 1 id more chronel ng disea rar has g of

The auth rs m d a st dy of 100 ums l ct d ca.es l po ta speumoth ra of the so-call d dol the type wh h h d occu ed in s l ctes f mitry recefirm m that y arabef th n duct m n tion

The right I ng was in I ed in 55 cases the left I gi 44 O e pai niga e a hi t 7 fb hate al no num th ax Th dt occurs most com m by nih ag g up between t by nd th to y ars

Spontaneous pn um thorax may appear asy mptomat cally as f und: 5 per cent f the authors 5 ries Fr m its dictorery on rout ne chest roenig n ograms t may be ass med that the accid near re f ouenit h clinically proved d

Recurre cestak place in about 20 pc c nt f the cases and n the me de R curr nee was un common n men over thirty e re of ac

Sports rous one moth re control mor often

n the authors series during relat 1 slight physical

undu phys cal stress or strains

Roenigenograms of the langest all nfr m mo the to railer e-expans on the claspeed lang were n gat e in all but 4 instances. In the great may be not cannot tell in the film the Lange and the lange that the period of the the tape cumbol rax ever existed more to did the peded to another lime there is not the patter to will be a tan aftur reurn new On the contrary name os a care of bullous emphys mas ener at the 1 due a state on gave o history of spontaneous pneumothers.

Bl d B Hamilton J E and Dugan D J
Observations on the Treatment of Emphema
Thoracis with P nicillin S gray 945 7 572

Wh a the possibilities of all ring the m mag ment temperan by the of pencil in e considered the questions of adequate dring and irrigain in most important. The pencil in tendency in the treatment of empy may with pencillin hash been it dels defininges and the rife rederease the hance of pinsture peration in the case with an locess in mill control quickly the pencil penci

I digital intervimente ndence this penuellan is a like e la indiputable endence this penuellan is a labella edigitate in the tatter of empering the sale ble edigitate in the tatter of empering the sale labella endence in the sale edition of the direct of

m nary and pleural les ons

Pr b bly pentallur vill be extr m by eff ctual in bottine, mpy maf mat o but neepus is friend and countine sto forme a nifst rile the b bins i cavity closu e cannot be gnored. If h ling is n trap d with the disperarine of piss when conserver measures are emplo d the authors belt extracted drawns is mandator. Falter it

that gical draining is mandatory. Falser the fund mental principle of digite draining for no point empire of the pure is deted temporaril trile his penicallus, will not the nous complication feat unit. This occurred is discussed by the second of a cases observed.

It should gain be mpha ized that the introdu t n f penicilin has n t lite d in an w t th fundamental pri ciples of tr atment of emp ma onl the death are chained.

Blades B P nicillin as an Adju ct to th S rgical
Treatment of Acut and Chronic Empremas.

A S t tout 67

#### ACUTE PO TP ELMO TO EMPLEMA

Observations and cate that when support at 1 flux rt is ca d to pen cell "ulnerable orga mintrapleural and tris of p. celli will timp ra! this to pen could be supported by the countrapleural and the categories of the countrapleural time for the countrapl

bl terat n rem ns to h ol d

Ase penen e with pen cll n therapy accum litter th therapeut cappr hes will become me to a addred. Based upon the authors beertains a tentair e plan for the see feencellines adjust to the segical treatment facute empy mested.

an apect on of so occur to free cultarity to maning full as soon as an feetefal, one are the full of the pears in the pluril entry. It is import at that treatment be withdefulutile regiment to be identified. This pears in while the pencilling in allections which do it eponds the drug as d an initial batternol goal diagnosis will all religious the possibility of a time rule. If it is not sufficient to the pencilling in the cost bulbs of a time rule. If it is

r mn ma 2 If sy tem penicill n bas be n mpl edd nag the pneumonic sta e I the diease the auth t hel es it should be combined with local the ran It admitted that may not a cesthern in nic pha e w ll bay subs d d by the tim a movem becomes appar t The ad ant ge of th si t m c rut howe r s th t the blood will e ntan a nt bact rish nh bit ry s b ta c h h may to t ol an ading cell I tis r in asi e inf ct n It the uthor to n th ref re that sy t m dm is test n I penicilia h uld al avabe comb dwth local th rapy. This is true particularly cases of str pt coccal ad staphylococcal mpy m s Irobable three intrapl ural ni ct us i 50 000 mits o hernate da a sa suffice t for local t eatm t B ing et dintothe pl ura much fore th penicall fth infectedfi das poss bl b ldber m edb thoracepteris If the pus co tes to for thick as surgical draining she ld be establish d T mporary r u perma nt t rilizat pus does n talte th most mports to dam tal urg cal principl a test emp) ms thoracis nam fy d quat dr nage

#### CRED IC EMP EMA

Afte ad q te dra nage f hr c m ma ca t has bee establ h d tappears that ther the focal no t m dmin trat of pen cillan is important D in the pe od f been at to de te mm. bethe the cavity will become oblite at de inboat furth r ug cal intervent a there is littl darger of spe ead on cellulatis or inv sive infection. Cat anced ver de failure tog in weight and other mandestations of seps s usually mean an und a ned on adequately dained collections of pus. No chemo therapeut e agent can be depended on a r place per def integre in the tree timent of programs.

Probably the most valuable role of penicillin in the treatment of chronic empyon is the protection to may afford against spreading infection when a radical operation is under taken if obliteration of the cuty. Whin penicillin is under an approphylactic

tfor this pu pos it is impossible to make a p e cise revalu t f jis b nefts. It seems r aso abl bowe er that when o e is wo king throg han in f eted or pot nt ally infected fild pen cillin protecton may ften p e ent serious w und inf cti s and th r complications

## THE PREVE TION OF POSTOPERATIVE EMPYEMA IN CASES OF LUNG RESECTION

Suce post peral. e mprem i the pinne palea s footh me tality and mo bed ty after the esect in flung ts es it; reason bit to utilize pen call n in aschort reduce the merdenc. I this ros scompleation. When the modificits became a aid bit in instead up intit s the authors emplyed time associately of emplements. The subject of the subject is the displayed to the displayed to the displayed to the displayed to the subject to the subject in the subject to the subject in the subject is the subject to the subject is the subject to the subject in the subject is the subject in the subject is the subject in the subject in the subject is the subject in the subject in the subject in the subject is the subject in the subject in the subject in the subject is the subject in the subject in the subject in the subject is the subject in the subject in the subject in the subject is the subject in the subject in the subject in the subject is the subject in the subject in the subject is the subject in the

ystem cally d1 calls b t there as n post lence; 6 cases so t eat d that it h d an app abl eff ct upon the; fection

R cently if a thors b e had an opport nit; t will epe cill n as prophyl ct agent; patients ub; cted t lobect my f pp rat di a es f th l g

Jo J M L Y M D

HEART AND PERICARDIUM

If er G J a d St w rt H J Th S rescal
Treatm nt fCh ni Con tricti P tearditi
V lork Stat J H 945 45 993

Chinconitr tiepeicadts sad cha actized by chrincib thekeing fithe pe cardium hich ochtact dast int f with the traidiast i filig fith hart. The esit fiths t frice within mileadic ct n the and unit m recembling hat fal Prck in 1896 emphasized the comm n finding in this disea e of avol emint of the hier and a cite and the efore it is often called by his name

The de that u gery might achieve result 1 a desar ewhich has rest tell the effo its of the physic can r attributed to Well who in r805 sugge ted the patients with 1 might be relie ed by resect a nof the period might be relied to the rest of the has a had unusual sugged instancts and who names away to have no one cition with the operation of the relief with the rel

Th ca e of the thick ned co tract d adhe e t pericard um has been relat d to tube cul s 5 pneumon; s psis o a previo s pe icard tis with eff sio as m s of the thors cases het in most of the proved cases the anteced at cau e of the c and t on has not been d t rmined. The pathological plocis in the waff of the p r cardium g ves ri e to a variet of less as The pe scard um is Is ve thick a d but the thicken g may be variable in differe t pa t being slight a some re a mark d in oth rs. The thicke dipe teard um may b made up wholly if fibro s t s ue o d posits of calci m may occu and e rise t pl ques sh is or a complete bony shill It site compess n of the he rt by it shrunken lope that g vesrs to the el nical mani festat ons f the d ca e

The clin calman istations comm nin dysp a ne ease in the size of the bdom n d et lagment f the he and a cites dedema f the feet and an les

In all of the set s of 18 case here reported en largem nt of the 1 roccurr d a cite wa fo nd in 5 ed ma of the tremites in 11 and pleural effu son 1 8 Dysp a on exection or art e twas pres nt n 17 and cy n is n 17 a Dist nt n of th pe ph r l ns d an area e n th v nous pressure was present; all of the cases

The le d gd s to a corr ctd gnos sare the; sidous at to d r pew p rt cultry! , so ng perso the preponder nt l er enlarg menta d ctes the acrassed prome ce of th; gual erns with creased ve o p essue the n rmai r! in ely norm liber til the pee ce c fan n n phrit rid days the liw pl. a d blood pres res and days the liw pl. a d blood pres res and the control of the co

QNS comperes and I'va es with chinc constitutions and tish reon dedwe subject dit hoperat and pricing deed my lift co. If metal and pricing deed my lift co. If metal and pricing deed and they are all that man lift and the lift constitution of the

The lift refer of 355 patients ubjected to operation with a primary in tail by if go per cent Of the fatalities 25 occurred upon the perating table and 49 occurred during the immediate post operation period. To his less there is operationally suggests that the peration suggests that proportive testiments in the operation suggests that proportive testiments of adolg rather tent to the control of the proportion of the propor

The preoperative treatment anoth the details of operatine proof it and post peratine treatment and during the discussion of the logical forms of the proof of the

#### ESOPHAGUS AND MEDIASTINUM

R san J Inf neile Meg esophag s (Megaesof g inf til) A h a g t form j d g 1 1941 9 409

The uthor rec nil) p rated on a cas f m gae soph gus na child se en years of a e At the age of a e th bad begun to hav do phaga and omits g. The case is illustrated with a photo-raph of the child and r entgeno rams. We actophagus is frequ nily confu ed with es pha usm pasm of the ca dia or to rp rot of the esonharus.

Th auth r has collected ?? cases ir m the l tera tu e 4 of h ch we e r jected as d ubtilul the other 63 con ide ed authent c. Brief histories of these cases are gi en with a table showing the details

ofs mptoms treatme t of caults

V eveophagus be us widd nly us infants and
grad liv in other childr in The chefsymptoms of
a phagus omitting ndpan The omitting secophageat the food does not r ach the stomach a d
de so not to tain gastine jie. Inspiration of the
contents of the esophagus i to the hrouch may
not be prochistion sometimes beens if the lung
b onchiectasis. These hild in in the treated in ach
mutake in disme as of he in hist curret the notpueumonis or pulm nary tuberculo is. Som times
the shad we of the dair of spha us in noaches in

cheobro chaisd p th
D agnoss may be m d claucall h cath tenna
ton esopha copp or t en graphy o nl o
autop. Th best method of d mo a hy roe t
gen graphy

of tra

the mediastinum and lead t a diam

The best in thod fire tim at up bibly d lata t on with a rubbe bulb fill d this ter the the inque fish the is described. This in the d has be u ed satisf ctorily. See estatth Via o'Clin A ren G Wo & MD

II man I. Ved tinal Emphysem J Am M

A may re ch the m dastin m bt 4 r utes () alon th fs casl pla es i the neck () through perf rati n of the tra h bronch s esopha-u into the medastin m (3) f m there perit sp ce a d (4) from the interstitual tiss es el t lung. It has also heen uggested that a may rea h the med. thoum though a passag between the panetal plutta and the hest wall it ben ath the viscerial pleura or the air may pass from the pleural cat the tothe m d a tump.

When air reaches the med astnum and is so field there it will gradually be borbed. When use c is press red wel ps hower a usually systems a line to meet a sum is the ps. It is a mount of the pressure at the oly fleet of store the locat a of the air with the mediation in supportant s or of the air with the mediation in supportant s or of the air with the mediation in supportant s or difficulty from orbin. When it is to support a difficulty from orbin. When it is the paths (i) mit the subcuta cous and dept 1 sues of the (ii) mit the subcuta cous and dept 1 sues of the neck () through the of phagma about the ris

and the esophagus to the retr pento cal tissues

and (a) int the pleural cavit es

A sim U ano int I are the med ast in may be ofuce by thrusal symptoms rin a stall Large am unts may cause a very grav d turba e de dt death. The effects of i crea ed media taal pressu e a e similar to tho first seed introperiorated by the seed of

agernate the symptoms
Th s gas of med stin I mphys m are (1)p
()s bectanrous and r trop intoncal emphys m
()s bectanrous and r trop intoncal emphys m
(so obt rat n I can dae dulines (4) pecul r
(sou dabe rd ertheheart (5) evident of ic e e
med satinal press r — dyspane y n n s mm; get
and (1) in r
(0) p intended not media by unforced to the control of the control

A mall mount of a in the med the mission had had of resh teatment Who per taying ms pipea haw e it becomes imperate to furnash a net itle th trapped a Three litta hatta ned by m elying depiction; it to it is es if the med stan into his hyperium or by some sum his imple method. An a sociated it is up a mintons shall be depaitely tel athe by firque tapirate of the plearing to the proper to the minton had been to the proper to the minton had been to the proper that may be do by to doug gan dit tale to a piece if the big the dit it of his his in the minton had been to the proper that may be dought and the total proper the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been to the minton had been the minton had been to the minton had been to the minton had been to the minton had been th

rted ant a bottl of w te

## MISCELLANEOUS

Barrett N.R. dB rn d W.G. Som L. al The raci Tumors B: 1 S 1, 945 3, 447 The their eport their extendantly becauth

illust te the pading cope fith csgrv d partly becaus the less thruseles m p P ly be described as u ual

A man aged thirty six was admitted t the bos nital because of increasing dyspinea in exertion over a peno i of six months fie also compla ed of inte mitte to essu behind the lowe indofthest num but there was noth g to suggest p in of the angin 1 type Roentge ographs of the chest revealed an nac ty about the size of an orange s tuated in th n ht chest a d ly : g 1 the a gle between the right bo d r of th heart and the dome of the di phragm The mass lay in the extrem fr nt of the chest im mediately hely d the sternum. The bronch al tree as shown t he normal by bronchoscopy and b on ch grams nd the diaphr gm was not naralyz d The sectrocard ograph was no m 1 and the possi bilty fad aphragmatic herma (the gh the fora m n ith ternal mamm ry artery) w s not great because roent g aphs of the tomach sh w d no pathology Op n on was d vided s to wheth the m s could be held to explai the man s symptom o whether the symptoms c m f m the meditinum the p ead m the lung th pleu diaphraem

Art ficial p cumothor v som t m s settl s a q t on of this type by showing that the lung ret th or without the mass and in the ease f cyst s ch as may occur in e nection with the parietal pleura that the util e of th mass alters aft r as has be n introd c d into the pl ural cavity. This method of a vest g tion is not v ry satisf ctory wb the opacity hes diacent to the medi str um be ca e the | g s ttache | to th e trai structu es by thep im n ry ligame t and it may t co mediast nal tumo eve if adhesi f f not pres t Art ficial p eumothorax can sometim s be scfully combin dwthpncumopert eumandthor c sc py purposes i dag ss in a tifi al p eum th rax was i d ced i this case but t cast add tional light upo the diag osis t upo the p int f ngin of the m ss Th ae t my was p f rm d and rgc la estics a The right plural ca t) was op ned by a short i tere st li ion d th mass was muned tely located lying tr pl lly mass was muned tely located lying tr pl lly in front of th p ardium in th p d f f t wh h n mal) is stut d n this re ft was f dt b ath n alled transluc t cyst wh he nt watery fl 1 The cyst w m ved with t d ff et) nd the ch st as Is d At the o cl perati n a as asp rat d from th pl u l cas to so that n pneum th r rem d C v scence as u ev tful Such c ses h uld b fllyd tngu hed Im de mod cyts a d t at mas of the med a tinum

e am ation est bl shed the dagnos s fa adenoma of the b chus The child mad a rapid co val s ce ce but the signs of t lectasis f th 1 wer nd middle i bes persisted. The gest no e as t whether i ther treatme t for the alenoma w s des rable or n cessary Th alternati e p oc dures were co a dered Co servative treatme t w a d s carded beca s at was assumed that alth gh bron choscopy was neg t ve at th t me there w sc ta n to be an e trabronch al extension of the neoglasm a dithis if ign ed would soo er or liter glow to a dangerous tumor The s co d suggest on w s to msert ad n into the br nchus h t the allo was ned down b cause r d n s w known to affo d but t imporary I ef in the g at majerty f these cases a din the particul repatient the e et t of the les on was d uhti I and the placing of the ra d m would f ce sit have b accurat third possibility w st doaloh ctomy pn umonec tomy P eumonectomy was preferr I because it was believed that the e trab nch ale t s n pr bably lay i th angl between th p lb bonchu and the m descordighonchu nlb cause the lowers d middl I bes f the r gt t lu g were known to be feeted and b ch cctatic Convalese c was u ev ntíul nd the child m l a rapid nd complete a cry

This cas was presented to two re sons. The first sthe mpo ta e of r ling th the great may rt of b nch 1 d n mass have a e tradro chi 1 s well as an untrabronch al part and that the s f ct m the taken 1 co id rat on when the merits plan ed. The s condrasso that the a rage age of o x t of symptom rases f ad nom of the bronch as stewnty-ght; are and this p tient was ly ghty ears old

The cod clase f d m f the br chus pres nted because of c rt n f t es which a of spe li te est

The xpln to 1 th curr gc dton of atel cass and recep so thel era d m ddle lobe was that they we pathy det the blocks g of th m in h och by th g owing thing of the fur m and p thy to the fact the top to sith turn to be to the fact the fac

2 Th t m wan test hil hd sa de ome thus while in my so "alab) for mostopy. The fact that a ot-cell cac om h d been class on d finm h mar rail secured at b hockey might h bee disatoust the pitent fithat be nationally might hold by might he can be not set of the satisfaction of the satis

1 This turn prew i om a r lati ely m ll b se nto a ped ngulated projection which occurred the while of the upper lobe bo chu this particula arrangement is pecul to that the ned cl w smuch

lo ce than is sual a I so te of the fat that the ni wrater at as contami ted hy pu duri g th in bilizatio of the upper lobe, and the chest was closed with et d a n

ace at the e d of the op rat on the patie t d d not de elonemosema

While convalescing f om catarrb I van d ce a three yea -old boy was said to hay de loned a left plental effus on. The sins indicated a solid r flu d les on t nd: e fr m th le el of the third rib abo e to the dome of the duphrarm below I ravs c nfirmed these ums a d also showed that the he it was cons derably d placed into the night chest A bronch scopy w s carried o t under ge eral anesthes a the b new of the feft f wer lobe n e dienlar d pwa da doutwa d b t n intra bronchi I abnormal ty was dite ted Rm chograms did not flord addit o al information e cent that they e nfirmed the pin on that the les on was

xtrapulmo ary The m st likely diagn sis was con drd to h a med astmal tum d of the art us possibil ties the l bulated outline suggested teratoma or a h nigh tumor s ch as l nom The racot my was do e u de general anesthesia. The tumor lay in f ont f the beart and e te d d

alo g the d phragm t the lateral chest wall. It was vellow in colo lobulated solid and with of small second ry c esc noes upo its s ef ce Removal f the tum r was n t d focult Th chest w s clo ed without draing dha the ir in the nle ral cavity h d be n aspir ted the ee eral co di ton imp o ed rap dis Hist ! g cally the turn was

l noma Afrita a cold om was dmtt dwtbcm plaints fap odu tiv e gh finnemo the durat o the right hest do p ea a feeling f hear ness nd 1 ing weaknes whe ea diagn sis of pulm 13 hyd tid tyst or p riph ral tumor f the lung had bee made Ro nt g n graphs of th chest sh wed t mo i th right chest Br nch sc py r aled thin b rm lin the bruch It ce The was ed tases Th pate thd o ccasi c ughed un a d th ed obj ct abo t the me fhrf fige which was recognized as a bio hial cast co taining mas es fm I gna t cells The right I gh s hee

m ed Wh m e n e e lat th pat t as good health. The path I great port w mixed cacin maadsa mafthein Thitwit pes fus. wrd lmied

IONEPH K NAM. M D

'nd

Thornt of T. F. J. Adam. W. E. Bryant J. E. and Carlt of L. M. J. Th. Use of Wh. I. Blood Transi i as la Resecti a of th Lung J Thorac S # 945 4 76

Rec treports ha cat d gainst th use f massi e blood tran f i as in pat ats und g mg rad cal so re cal n oced res. The da g rs in m. thoracic u g ri seem to be two-ctrat roun . nd pulmona d ma

Dog xpe im nts have shown that if Imm a z mu fs dum citrate per kl gram is g en in less than fifteen moutes fatal to c re cti na are ant t con If the administration tim is I eth n do calcum i us are added death does no

ever Unde ordinary co ditons a p t of ne rved blood contains 2 c gm of sodi m citrate le would be necess to then to g a m n we shi g to kem 2 coo c.c. of blood in fift e minutes 1 less t por x mate the fatal dos I s d'um citrate in anim ! This t ansi si n rat is almost impo s'bl in man and a s d m reform th t retvofthee

trate could be pe nted by th u of cale m
G bbon and his cow rkers uggest that f lio ine ext as e tes et on of the! g when la ge af a are given pulm nary d m is ik h t occur a d they pesented clinical cales in high an load d circulation probably result d n p lm nary edem following lung su g y The s m gr p bstant ated this clin cal imp ess n by a s es of w li controlled exp r m nts n cats. This rticle pr

sents imilar bservati us on d es

The a thors are it ested in the we of master blood transfusions and believe that the liberal use of blood t r pl c perative blood loss has made oo s ble the r d cal surgical treatment of certain diseases 5 ch as co cinoma I the econhagus in which the operat as are long a distend d his co. iderabl blood loss In th racic su g ry e ry cub c ce timet r of blood | sho ld be r placed as on chis as possible by whole blood thee shock d tob m singe moe slypr t dth nteat d Ham sle ad glucos mi onsd nt

supply the despet the did red ells a did late culating blood that r mains. The a th is published ta n . l b ct mes h h th as rar pet nf n fwhol blood w quz8ccad

5 pn mo ect mes i wh ha a eage I ofo w g Thes figures i tabo t bal C.C. N & th m s r d blood los f the operations as d t rmin d by Whit ad But What these lag amo ats of blood r gi 1 a short t m Ittle alin d gl cose g in the n t tw to I rh urs on of the pat ts d eloped any dence fp lm nam ed ma o mirate pois n

Fugr ps f peum tsw care dut In th best 8 d gs e s bi ct dt l ft total p eu m ct my dupon complt of the pet n transf dwth 5 cc per kl gram cat to while blood ( c f pe c testrat as at gulatire hs c (blood) All of the dgs rvi dth p mnct my nd trans fsn(th nfus tra aradfom t twe t) three m tes) Th dgsddwth the frit w k femp m nd fdistempe Atpses w d ef mt t ghteen days f llowing th ope t n d th was n clinical natomical fp Im nary d ma Th perat blood

loss averaged 20 c c and f llowi g operation the ed count consistently wa el vated 500 000 cell ith a c respo ding inc ea e in b matocrit and hemost bin

In the seco d group 8 dogs w subject d to bectomy of the right lower and accessory bobes he has follo ed by a transf s on of 15 c c of cutated whole blood per k logram of body weight ly rounately one month 1 te the left lower lobe as resected and a similar transfus on given The sing 6 lobectomy was well tole ated. One dog died if eduy after the second stage of t nave m das t lands beutaneous empyerms. To odgs del f a lower loss well as the subject of the second stage of the same died of terminable cause. Transfus toom ete gie en in from even to twenty six m nutes and sere not fol ed by pulmonary define. A is in blood courts

m lar to that n the first group was seen T el e dog (group 3) r submitted to lot c t my of the right lower the ac ssory and the left lo r lobes at on s tung and then t ausfused with 30 cc per k logram of c trated whole blood Six of the dogs we tensfused at n ma tes (in fr m e n to t el e minutes) d the other 6 in fr m three tos minutes Of the se en to-t el e m nute gr p 4 d ed in from two days to two eeks of vari ous eauses, but none develop d pulmonary edema M c oscopie sect s showed congestion of the p 1 mo ary ves is b t no edem Thr w sam ked me in the blood counts occasi naily as much as 1,000 coo red blood cells Five of the 6 dogs n the goup wheh we e transfused in f om three to six minutes des loped pulmonary edem and d d in one ort o day At autopsy th traches was f ll of blood; foth nd blood tage i fluid escaped f m th cut seets as of th heavy soggy red lungs Mi croscopie sect as rev al de tens edema fl id n the leed rsp ces

In the furth gro p th ope ation and t I si n were car ed out as in gr p 3 with the dd tio of bl di g Six dogs s bld 25 cc pe lal gram of body eight (50 c c less than the amo nt the transfus ) The bl ding as carried t f ri th f moral arters while a tr nsf 10 was runn g to th femoral v n The plan f ths perm nt as to old or rtransf n Th au th is bel there beld that the blood I some blat rall bectomy probably was bout so cc. Of the first 6 d gs (group A) 1 developed p lmon ry edema and of group B 2 dogs d v loped p lmon ry edema All transf sions w re g ven in less th n t n mautes The authors believe th t 11 d g a d transf s on her tend d to sim I te per ti blood loss and replacement

One mu t v d apply ng data obt med from d g perime tation t human clinical practice. In add tion to the bac physiological differences be tween dogs and hum beings certain condit on peculiar to this experiment must be considered. These factors must be kept in mindininterpiet githe findings.

1 Blood loss in dog sutgery is m nimal mpar d to bemorrh ge in similar operations in patient. All animals exe pt those in g up 4 were vertran fused.

These e periments are unusually r gorous Chinically bilateral lung re ect on is done at staged operations t monthly intervals. The amounts of blood used here were not excess; e but were given in a very h rt time.

3 The remaining I besin dogs are no mall hig figue thy in clinical supportant edisease of the lung the upper lobes may contain residual double as the bave no accurate mosurement of the d

gree famy of ed ma that d l ped in the animals that s v ved

G bbon has shown that animal subjected to l or

resect on d n t tolerate larg transfusion as will as don maianimals. The thors belive that in add ton to the am unt of lugreected thee ther fetors are prese t

Obv usly the amount of blood given will de term ne wh th redema d v lops

2. The t m of tra sf s n is extr mely impotant at feast apenme t ill. Clin cally this m 3 not be impo tant since blood is gi en considerable slowe in mot stances

3 Overtransf sion tends to promote edoma If a transf son no matter ho large is given to replace hemo rhag in a reasonable pe od of time or simultance s with the bemor hag pulmonary dema Il p obably not cue cept in the pres ee of

e te card ovascula or Julm nary disease

When a patient's stams see ere hem r hage in citical pactice I lood may nt be a rallable for mmediat replacement. Then large amounts fisher experience and make the replacement of the result of the results of the resu

## SURGERY OF THE ABDOMEN

#### GASTROINTESTINAL TRACT

Riole L. G. k olan H. S. and Hol. D. L. Per nicio s An mis and Tum to of the Stoma h J Am 31 1 O15 1 8 4 5

Min efforts have been direct ditoms dish as ly r cognit on of ca c oma of the st ma h E n with a aste pansi n of methods froente n d emosis a reneral use of gastroscopy more e tenst e methods of e min tion f th castne cont ats and stool the sum t tal of results is di con amn sal age of but 2 pe cent of the pat ents fillet d with this di ease te en the survival of 6 per cent the maxim m ported or es s me da dahe de cult es in 1 ed

The in, di us on, t of eastre er cinoma and the absence of triking symptoms even in d'a c'd tumor are s me I th difficulties t be urm unted in establishin the diagnosi Roentgen examin to n is a nerall cons d ed the most a curate procedure yet the dr gnos s of malle t mors s f quently o erlooked In support of this view th authors cite a pot film of the stoma hof a parent with perni e us anemia dem n trat e a benien nolyn amm in di meter. The lesion was not een on first ment en examinatio but was I und gastroscop cally and th n demonstrated on r examination in all p obab l ty many uch les ons a e mi. ed

In an fig t to test the accuracy i the roente n method in symptomless indi du ls it was deem d r a onable to xansue a elect deroun f pers us in wh m the incidence would likel be highe than in a gro p of pers as elect d at random. The auth rs el cied a group with perpectous attem as since a r in a of the literature eem dito indicat that these pati at w uld offer the most product e esults Accords 1 in 1910 they undertook the roentg nological amination of II pat ents with pernic ous

anemia at emiann I interval-

The coexistence of permiciou an mia and ca ci n ma of the tomach has been studied at us els ince it was first observed b. Quincke in S. 6 \ m er us cas eports ha e ppe red as well as studies f chinest ea es and a f w autops; enes The a soci t n of pernici us anemia with carcinoma seems t be a n Hestabli bed fact but thece is a diffe e ce of pin on as to is f eq ency An iner a.e in the coexistence I the two diseales is and nt and is best illu trated by the an us ports f m th M Clinic durin th la t twent 3 ats This tre d may be de a part t th bett cognit t mors b t may allo be d e to th merea ed l n g att of patt ats with permit us an mia resulting from th austitut n of h theraps In Il the ca. reports thir is a valit p epond rance find duals in w mga tric tum is a di-co ed ithe es) r am 1 time after (as In as e ent en taneousl with the duco on fth permit usanemia

The data presented in a large numbe I st en and cat ci siv that an et I great rathe th n an accordental el te n h o exists between pern con an ma and tumors of the stomach. Most in est gators have concluded that there is a comm n no cursor f the two diseases \ me us the stades point to a her ditars o familial deficie co which predi poses t both diseases

Anoth t phase of the pr blem des ries special att nt on nam is the r lationship f be on nol me of the st mach to permit u an mia adal t car cinoma f th stomach. I r us investigat is ha f und that ben en pol ps r s n m r fent t

carcinoma in pat ents with permit us an ma-L ttle doubt ists that m n benien en th lial tum ors fth stomach may d I p pt cancer The e i e the discovery i poin i the t m ch has ereats guines e A effort fi ctareduct nin the n mbe f cases of car mom f the st mach m stg decon drationt the dealt estmet of these polyps. The possibility of the mal mant d se erat on of a polyp mu t be part cula ly bor in m ad in cases of permits an min horn t d nev f th latte to devel p carein m

The pres at report c ata as a mente at it of pati nts with pern crous anemia. Roe tre ex meations f the st much with brimmal we e made. In app o match 20 per te t nly e xamunation was made us ally at the time the an mawas d over d In the remain a some se t multiple am tons we md uulli sem ann alls Painstaking fi rts e e made t

n toni ca conoma but al o ben en pol re The a thent city of the deg os I permit n mia was establish d in these cases by blood mears bon m rrowst des th present of glos sites the find es of bacut e mb n d scl ros an

hlorhy dria after hi tam e nd by the clin cal d hemat logical response to l r the py Ga troscope e ami tion was m d i man of these patr nts and all f them th gastric cont is and tools we exaref ll) tud d Almost all of the re ports of carcin maw e confirm d by s gery o by antopsy May of th bengn tum cases we likewise confirmed The res lis of the study showed that ta canom was fo nd in 8 pe c t (7p tc ts) a d benign polyps in 7 s pe c nt (5 pats ts) ftb

C2.85 I an at psythy port d bewhebte a thors 2 t pe ce t f th pat is th perp cous anemia w ef d Lot ha e cac ma oft

Outstandin f t es which characterize the f d nos n this ries () the rap d han f m 1 be gu pol p t a cance ( ) the p es ce le by ide f both benim and malignant t mors (3) t e shee ce f smpt ms in th per nce of la t m r nd (s) th de el pm at fr m s small

barel detectable lesion to an extensive inoper ble cz cinom

t The ran d change f om a b n gn polyp to a ma lignant tumor 1 well llu trated in a pat at with a progr s 1 f m permic us anemia through g t ic polyps to a f ll blown g tric ca ci ma 2 in a number of cases ctions from two pot as

of the sam gastric polyp removed surg cally from a patient with pern cious anemi showed a typ cal benga papillom i o pot nanda typical inv s

i e care n main the other

3 The sal g of cas s of gastr c cancer with ut symptoms by gery afte disc ery of the tumor by routine proc dur in p tients with penc us anemia has been strik glv llustrated in a number of instant s and s gratify; gre it Ithis study The authors ; tr duce an interesting case h t ry in h hth p ti nt had no gast csymptoms wh te e Further quest ming aft the d c ry of the ray findings leited complaints referable t that m ah The sch act rate f pat ats with hen gu pol ps and the les si nd t ta nly benig in origin litho gh maign t dege e at n had all eady occurr d. The cas strike gly dem n t ated th u ual equ ce n mely atrophy of the gast mucous memb e th pracos anema be g polyp and ad nocare n ma

The d velopm at form smill he ly d t ct abl les on t ne t ns ve inoperable c cin ma was llustrated by a case which sho d the unf t t outcome which att ds the falur to r peat raminati ns When first am d the findi g wer not suffice ntly defin t t ) at fy surgery ad uni riunately that p t at d d a t turn f e ex m nati n s m nnually When ramı ıd roentg nol g cally as a r ut ne p oc d too3 is lat r the patient p s nt d an e t n poly poid carcinoma of th stoma h Su gery v d taken btete iem tastas see fond The t mo was of th bulky t pe and me ed a cm nl ngth At no time was the gast e dist e vth g mor than m nimal Had r -e am; tions b mad at ix m ath inter als that mo would alliki hood have bee ds er d ghteen m the al rat

hehtime su gery might lib e be sec fl The lack of symptoms was tst ding in the entre er pof pt nts Th auth r ref t instance in whi h a patient 1 k d th pct h lth and the hemogl bn as 90 per c nt th a n rmal d blood-cell c t nd vet les at n em tasta es vas f nd Tr d guos w arr dat by mans f th ntg gram which dmat toth tum rs

It ould apperf mth t dv th tro t a nual roc tg n examinat n f th t mach in pate is with per c u an ma sah ghly produc th p oced e It does tho e r pen trat re deep 1 t the p blem of ly detecti n f ca ei arm of the t m h in oth cases a ce at m st sper c tof th pati nts ho de I p cance f th ir ch will h ve pe n ci m Th uthors and cate that the results brain din this st d point the was toward a m gener i tlzatin of th roentgen e am nation of the stom ch in I ger ps of and als who might be lik ly to d v lop e rem ma II for instanc all ind idu i with achiorhydri vami ed t n h and repeated ly it might he possible to obtain a la g s lvag M TRI S J SETTE T M D

Lannin B G E pe iment | E alu ti n f Sati f ctory Ope tin fr Ulcr S g > 945

Stud s on the effectiven s f va ous typ s of op rative procedu s a preventing the devel pment of ulc n e periment l mals subject d to im pla tatio of histam e heeswax mixture i ere made Eprim taluler may bood iby a a ty f method b t the m jority of them invoke alterati n f the norm 1 at mya dphys 1 gy fth nm 1 An t si e revi w of th It t on the exper ment 1 | ducts n of ulcer and cates that C'd m th d f impla i g h tam be ax p ovides th best means of p odu g typical chr ic du den l leastroulce consistently n ta ta imal Furthe th p p d ance fe d nees grests that th m st impo ta t ngl facto in the causat s a e cess of un cut lized gast c acid The pim ryr q teofasatisfact ry p tonf rulcer therefo s fi ctual reduct f the ga tric ac d ty By mploy g Cod m thod for pr d c g leer th auth r could ev l te the prot t influence of tw l oper tive procedures c mm ly used: th surg y f ulcer in attempt; m de t c lat the eprime talfid gsv thein caldata ale jo a rail bl Theproatlults ar pesinted n g ups n cco ds with the type for tive pr c dure employ d

Grup Gt jju tomy as prform d n 4 dog Late they weg en the hatamine b a x mplantati as Ulce dev I ped n all of th m is and a dogs di d from pe t tis due t perf ra flarge jejun lul ers Th tesapp entth t tı perat on offers no prot ct on aga st the de 1 th opm tof ulcer but nth ont ry ppears to ex

n d te its occu rence

up 2 G stric resect n r a tral e c ion The peration cost ted free ction f the neral gm t of the tom ch hich comp ses 25 to 30 prcent of th t tal ea C ti uty was then e tablish d by g st of junest v f th B ll th II Ul d I ped nalla imal Th sop ta tion f is t red th g tr acd ty adequat ly nd must h e s dered sat sf et ry Cl ical vi ce confi ms these find gs

Gro p 3 Extens ve g tric res ct on h ch c n tols the gastric ac dity and sures ag n t recurre t le a dy tla es the res dn lp uch l rg enough prov de dequat gastric capa to wo llapp ar to be a sat f ctory persti Su hap oced ne c toi the st mach f Il wed hy na tomos s w th the first port on of the je; madi ers n of the lesser e reat re accord gooth H im isterp tiern The operatio compl tely p otected the dogs against th I pment of perimentally induced ulcer It is learly and cated by clinical and the exp mmental e d nee that a short aff ent loop contributes to the pr tects n pr vided by th Thus e ten perat o the e-quarter resects n with a sh rt loop a as

tomo s would app at to b the most s tisfactors procedure

Gro p 4a The Finsterer antral e clusion with e cis on of the antral m cosa w s I n d to be as ac ceptabl as the three qua ter resect on This procedure is of value in deal ng with o-called in perable du denal ulcer and varies fr m the exten i e esec tion only n the tech que of m namng the d fall tump

Gr up 4 The Finster rantral e clus o without excisi n I the antral mucosa p otected 4 dogs again tulcer but er si ns in th gast ie pouch were more nume ou than f li win Group 3 and sa p erat ons Although the experime tale ad te s not conclu we clinical evidence and cates that this p oced at ho ld be ahand ned in favor f the Group 3 a dua operati na

Group 5 A trait res et on pl s total ntragastrie gu gitation th Schm linsky p ocedure w s found to enhance rathe than to protect are not the de el opment fjeju al ulce and is to be co dem ed

Group 6 F ndusect my with gastr jejuno tomy app ared to furnish sat sfact ry pr tection aga ast the de elopment of jejunal ulcer n dogs Chin cally however the gastric capa ity is less adequ t than that foll win the Gr up 30 42 pr ced re since the most d latable portion of the stom ch is remov d

G oup 7 The perat on in this se es ppros mated Connell's rightal procedure a d was done on 4 dors. The placed r off is les protection than the prec d go e since of the do s developed duod nal ulceration a d the others developed mathed o o s d ga this on of s pat erts p n whom the operat n wa d e became chlor hydric and emptoms fr m th ulcer cont nued in a of thm. The print pl f f ndu e tomy cannot compete la orably with the C oup gors poceds e a d th clinical indications f t uch a perati n w ld be much m e limited

Gro p 8 flem castrectoms It ppears that this operat nd snot furn h d quat p tect ccast nal ulce which might delop ill wig this p ocedure outw ghs the imp me t of gastne fune tion which might foll with in reiten i e resec

tı n e clus on and modified Copsgadio De De n exclusi n with total intragastric regurgita t on These proced es pro ed neatisfact ry and r to be condemned

Gro p 11 Sle e res ct n r egme tal gastrec Although the spenmental ende ce s n t conclus v th clinical limitat ons I such an opera t e procedure are b ous

mber of r qu reme ts which a satis act ry operat nm t fulfill re appar t 1 ff ct duct on of gastn secret a must be complished-

this necess tates the sacrifice of an extension me t of gastric tissue including the antrum lesser curvatu e The manner of d odenal in is a with or without rem al of the ulce s of no great consequence b t ll th antral mucosa must be

rem ved Although the exp rim nt le idence fa rang the Edkin's hypothesis 1 of co cl din cal tper e ce i dieates clearl the importa ce of the a tral mucosa The nastomo is with the ju um must be made o that the aff ent loop is as sh rt as po sible The short prox m l loop is nd cated by chinical e dince a diby the pos bity of the secret in facto and decre sed to sue resistance to ulcerat o with a lo g loop Extens ; the quart r resection 1 clud g the antrum o at 1 st the an tral muc sa and nastomosis with a sho tp m! ff r nt loop has be n done of n rally t 300 pate ts with utas gle instan e of recurr tieru al ulc

De Aze edo Sod e J P Tre tm nt f P rf rat d Peptic Ulcers by Sec d ry G treet my (Tratam to das il era pept cas per f da pe ga treet mia ecu dan ) Rev b ar l 944 J

IBVL LIDOR MD

In the emerge cy hosp t 1 n which the a th t hef of the su cal service to cases of per forated ulcer of the st ma h duoden m were see f om lugu t 938 to August 1944 I thes case in all of which the ul r had perforated i to th p ritone leavity a limear rp rise string a ture w m d in two pla es and co ered with framme t take it m the e d f th m ntum A ped cle i me t pla ty wa n t perf em d no der ott fe th oment m n the upper p rt of the bd mt as feem bility is n coscary t its norm liu eto g In ally cas gastroe tr nastom sa was pe f med In 4 ca es must ken dagno of appen d cutis wa made O ly z ca e w s dra ed f rty f thes patie to teco t da dr ded am it lty of oper cent wh he mp res fa orably with m t I ty statist cs quoted f om th f gn I terature Brt bist ries are go en of the caest wh b death o curred

Acro g these 40 p tents with perforat that survi ed 13 ret med lat th ever mpt ms of u er Endently the ut ehdsa ed thil is but had not put a st p t the pr g ess f th ulce Aith ugh ch cal dugn s f perforat dulc difcult roentgen ex minato w mai yet m t cally and howed pneum pento eum. The per forat nedid trecurin ) fthes caesb touse ported Of of recurre t perf rat on hav be the 3 pat ents tust ret med to w e perated n by gastrect my and 2 by gast or teros 2 tornos s pate t was go en m d cal t eatm nt Th t h n que I th gat ctomy described a dh t net r gi nof th 13 cases Poentgen grams ph to-

graphs I th operat specimen and ph t m crographs f th hist I gical find gs a also gi t The other lules that with fithe tm chis i deated in this eatment I perfirate i pepto leer in the had of skill dis rgeons Th menten grams sho fu ctional readaptat stor chafter gastrectomy

AUD ET G MOAG M D

Frase K. Malignant Turn f th Small Int B 1 J 1 g 945 3 47

The a tho ene ed the stat stics of the Western lasermary Glag frth ten years fr m 1933 t 1912 Du this d cade 13 cas s of m ll bow l mal a to er i u d thr t operatin ran tpy D nng th am periol th w e peratios the gist i test all t ct (includ g th blary sy tem) a dth total h sp tal a top numbe d 674 Thes 13 acc pt d s s ere all predht! cally rf dat aut psy 6 car oma a d 7 were sa oma Malg cy at th ami lla f V ter was n t I d d because f the difculty of pr 1 gatr testinal g fo th e i iclud d n which m Ig cases buthe no cas ancy lewbre in this tist es s also pre t To these 3 c ses a ddd 8 oth rs f m a sources m king a t tal of 21 eas were e re n oma and o s rc a fn 7 cases the tum r vas l ca ted mith j j um m 3 caes mith fum a din

the locatio as ot stat d Sev ral a th rahave a greated th o a s a to why mal nes so much less f q ent in the small in tests e tha els whe in th intests al t act a d'all m to b gr d th t th s is du t th fl d t the c t ts t alkal ity a d the bs ne f

abrupt be dsandst ss oty cal of the c 1 n In may f the caes the o set f sympt ms s stadual a d may last m the and ny are as a com what vague stry f eak se d asy fa for with progressive l s of ght sometime amount get 28 rg po nds In al gen mb of cases emia as a m kedf tur. Abdomin laymp

t ms a d g app r late f ome c ses the sit d haract f th t m r fluence the type of ymptoms p od ccd th s a high tum r may gt ealer gastre ups t th naus and pa ccurri g at a rable times aft r meals ind acc mpa d by ton c dispep a in m e d st lly s tuated gr wths gast c symptom myb m de t gad th re lo eles oted Cha ges in b wel hab tare e mm

us ally 1 the f m of an creas g co stipat alth ugh t of eque thy alternat g c stipati n ad diar h a ber I Once gast int stn 1 a mpt ms are e t bish d th y usu lly take the lorm f curn tt ck of test al bstruction with s dde s vere cramp in th central nd lowe abd me acc mp n d by naus nd om t g a la feeling of abd m al 1st to with b borgem Sm caes t fretse scaes f intest nal ob truct which f cute will show the " alpctur f m ting cramplike p abdom mald tet n and vis bl pe tls first s en as perf rat s- cases o p

th seres we e such ra) has a rv def ite pla s n dtod g fralg ant small bowel tum rs I a yeare of persistent unexplased mel na in which x ray i vestigat n of the stomach and colo shows no ab no mality and prov ded the e is no acute intestin 1 obstruct n a full x ray investigat on of the small intestinal tr ct is i d cated

The c mmon type of carein ma fo nd is of the e nstrict gring var ety s m l r to that type so fre quently f u d the distal half f the col n a d pese t g the h st l g cal picture f a columnar celled ade ca c om An occas o I complicat on fith a ul type frum ris the courence fi tussuscent on

Sarc ma fth sm llintesti em y bea nulara l st icti e polypo dal o tubula. The obstru ti e effect of the a 1 rgr th my be made mo emplt by pessure of adj cent a di led fymphel nds The t b l typ of gr th m vals cause acute a test nal obstructi n I forat on of th advace t all oce ra rarely

The tre tment f bo eas resetto f the affect d foop of b well all g with a cdg of elt d meset ry a d contained lymph ties. The continuity of bowel is e establish d either by an end to e do a lateral anast mos s P st perati e or palliat ray therapy is recomme ded by many

In the a thores see of 22 cases 5 operations ere performed 1 3 resett and anastom see was carried ut in case at t ge procedur we define the first a lateral anastem os to sho terre t the tumot fill well ut days lat by res tin of the t mo the the roperation c sted of smpl drainage of a p l ic beces. Of the 15 pati ta o ded with f tenday g gan p ati mor tal ty foo pe cent f th m p ss bly 3 had p r fo at ons b fore a lm son t the hospital F r th cases of care om submitted to operati operate mortal ty w s 50 per c nt a d for tho e f

sarcoma at was 75 per ee t
The prognos is bad the immed ate because f the degree of b truct pres nt wb n th pate t is first see by the surgeo and the lat because of the high freque cy of meta t s

Jo r K NA M D f th Sec d P rt of th

Crymbl PT Ul fth Sec d P a
Duod num B 1 J S 1 945 3 500

The author reports 4 cas s of an ule in the s cond part I the duode um a d draws the conclusi n that whe a pat thas duode alsymptoms b t the first part of h s d ode um is ormal x ray e am tion ando s g cal pl rate the palo t n of the

see nd part f the d ode um should not be neglected In the first ca e the ray e am n tio re e led n gl s co tractio w th a small medially pl ced d vert cul m of the s cond part of th 1 ode m At operat n palp bl lump w s fou d 1 the w ll of the sec dp rt of the d odenum

rit upper

d and correspond g to the hourgl sa c ntract on th rentge ogram Po te or g st cent ostomy wa perfo med

in op qu'meal in the s Ica eshow dahype per staltic but oth rw n rmal stomach a d c m pl te ab nc of a y duod al shadow At opera it un or gastre no d odenal ulcer fo d The second operation perfirmed twy aris lat howed as plable thick any nthe an inor will off the upper part of the prisedece de duode i The gas trool to gam in was dhe entit the ulce a A poter or ga trouter at my wap if m d and con less ence was unter the till.

In the the design page emeal hone da a very large pt sed atom: the dwish a compile six horigistric ete to the the the month of the the stomach was large atom to and his widnes of trust in the pile rus. The was a had diump on the condition of the dood in about this elia alut. Poste in registre enterostomy with produced.

In the late case there we no gastneement despite the presence of palpabl lumpat praton. From a years one we sacustom d who ndu cleand lerwes petted I mut the matter at the first part but sees the ast ported by the author he with titus also error palpate the deeply situated upper half e and past of the dodenum Only the palpable the room pred but the it theon which a utable for operation.

Graham R R a d T E B Th Tr tm nt of P rf rated Duod n l Ul e S gr 945

??4
This common ication dal with the teatment for a dealer a for first edulce. The total for ted

to the consideration of perforated disorded laters hecause the number 1 perforated gastic culters is clast by smill disorde a consistent factor and the same as a consistent f

In per our g the poblems fractum than the state send quest in sthem first one by Why; the part t with scute perform a tand odensal fee sk? Be tend call study so the procele unders fitness presents and case that bacterial per tot. It is the factor responsible than Illess In the group strap treats and cather a which there not 7 per at 4 of the the

m which there ner 7 perats de the the e

tributing fet rt the fatal ty.

The a thorse enclude that the snosess filmemers news at a crimito to () the dige of antia only in (2) the tet fib chemical means and (3) the dige of other constants of the consta

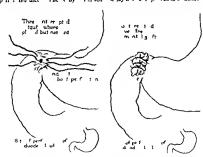


Fig. The plane of the estimated the performance of

l order t unde take the op at e procedu e dequately and telligently a furthe qua st m st b an ered () Wby; mr gney op at ever n essawy gastr int t all disease (s) Wh t s the s geo s re p s b l ym mr peny perat on on the gastrontet l tract (s) lpon hat do depend f the closure f g t test n le froat;

I as c t the list q ti ti ti b th t an mgc cyop at is do s lely becabl that without operat n th tat nt lel na s to the seco d the urgeo shit, in an eme ge cy ope at n lely t if and to do th t w th th m st smpl m in g cal precedure y hch, il a c mplish th

In a r to the third all g t test 1 f t ns r cloed by the firmation f blur f ns r cloed by the firmation f blur f ns cecptin the tenet the the sg n h r sponshill ye cept to save life are sg d s y deb te as to who the h huld do a e m t t gastrige is may pyl plasty or g tre sett. None of these procedues necess ryt sa the p tents blife. There is no repon bluty at this time et ber to be the developm t pyl c buttuction, r c this path of b doud all where Realize g that f b im respinshill f r the dous of all pe fo times in the gast test in l

tract we gud fibrin to the pe fo t in the most suple ma er poss ble

The auth a method f gu d fib t th per Th foration s illustrated 1 figur s 1 and terrupted catgut's tu ar spaced or the print on pull to the log of the did no a dapicce of ome t m e th ttahd dtachd d tied i place Th t slidacr sthea r ted 1 st suffic thy tight to hold the me t m in posti and attempt s m d to l e th p riorati itself I ib in forms this a sel the losure Goss perito leud t is s prated and the abd mn ino nd cl d tl t draig Sif am de drugs e lit ticp to cal cavity in o ly 3 e se nd a ot The auth cond mn all p n c ss ry d es save s mple closure th op t fo a forat o JR L LI pq tpr ΝĎ

Gra II k d Sh pe W S Th P bl m f
M 1 H m rrt g f m Du d n i UI rs f
P tt 1 B y d Middl Ltf 1 S g 945

Ample d ce has b cu It It mpha sethene ity of rect gth pyl h te and a trum whe rp s ble the f hgh gat cres etinfrd len lul Th h ve my tac whh bds chandealpel () bild d t lesin this te f cti e inflamm i d s founded with I du at d d d matou t s when the pat nt hims if s n c dit 1 g n c t e res ti n or (3) h b th e e st The su geon th m t c se j dgm tad pe form th toperat on which em dated

Th D vel so perato uld seem to ha e only a i m ted place in the repertory f treat tid oden luicer Of ag up of 62 p tients f all ag s f r whom the operation was done 52 c ld be traced by the authors Forty per cent of the traced t t svere known to have bad recurrence f their t ubl H weser if th operation is to b do e at all it ould em indicated ly for that small I el et gr up of eld ly patients who have bld g non bt et duoden llso sand who u rea nsa en poor c ndition fo ny type I surgic I t eatment Sevente pat e ts aged fifty s r more fou d to be included n this goup of 6 O f thes p tents d ed se en days after the p ration (6 per c nt) Of th ema (4 per ce t) cl d in the group of 21 h ь a' ce of the r tr ble O e f these 3 has ce b om Il Thirteen v ep t f the g oup f 7 (a 1 c c t) ho btaine I good results from th 1 rato Whi o ly 31 (6 per c t) of the 52 pt t fall ges whom th a thor s cc ed d traci & bt in d good results 13 (81 per cent) of the 6 Herly p t ts have not had any further tr ubl In rsurvi I ag dargument fr the op at n

Jm n E M d Hoey W O P toperatie Phy 1 logical Ci ng in R gi n l II iti d J S g 945 68 369

In eas frego lileits the tm lil um e sc dn e lon and half of the t to the tmm bil aed as I reserted. O tro tee the lileit of the

finshthed flerence In order to me tanthe; opce net it in of the remain glettel bit it fill tume of the blool as rick all him c c tat nilboed. When the lum of the cu cult globod che criticall eltim be doin culat yell pre and a typical; ictu of sheck fill with Thap et emay ceurs did nil

The conliton vasid metally entilled) a plind noflinged a titles fiplam and r misle titled grammitateouth A on steels kittle trielect by the blan by albat v the direct visit and the cilther variat before the critical list ach i Surry Josepps MD

Catt G D St L R B d Sc it II W Jr
Lymph m of the Bo l in Childhood

V I t JJ M 94 3 6

Pr mary 11 ms f th intest ear tr mely rae t idhood c rad th th se d !!

life. Except for ad nomatous pol p m t test n l tumors in early lie are sa c mat u Lymphosa coma is one of the more frequent types I this gonup Four cases of lymphosarcoma dicas of ricu lum-cell sarcoma of the intestine trated at the Child en s II sp tal Boston du : g the last fift en years are reported

Lymphosa comas m y rema temporarily local ed t th ntestinal tract but ultimat is thei in ad and metastasize as malgnant neoplasms These tum is a ise the lympho d f ll cles of the submucosal I ver f the bo el and infiltrat the the l v rs Ithou h t nding to rema n : tramural a d to e tend thro gh m cosa and e osa only as a relati ely late cha g Th ref e larg lungati g

masses c mpl t ly envelop g the b wel may d el p b i re intestinal obstructi a is caused & llow h wh te sub eros I plaquel & tumors Ir quently umbilicated and fr q ently multiple r p es nt a lati ely arly stag f th process S be osal e

t nsion may ca s diffuse thekeni g a d dilatation fas gment of th bonel

The patients w re all m les Th ges of the pa tients v ried I om four months to se en scars

The sympt ms were th se of any a testinal tum cau ing obstruct n-ahdomin lo 1 an e 12 and con t pati n being mo t lr q ent and oces ionally associat d with fation and irritability. On exam ati n an abd minal mass was noted in 3 cases which toperate a proved t b an intus u c pt d tumor n cases The frequency of a tussus ept n is n tabl lor t courred 1 3 of th spati nts The voungest ptent n th grup af u mo th-old baby had th symptoms funtussuse ption and at operati n was found to ha e nt ssus pti n f th leo leal typ caus d by sm ll lymphosarcomas of the termi lil um Tw lder patie is six years of age had ces goo sup ton frf m the espects b which idt fecal impaction On f thes p tients de el ped cut testin l'ob-truct o a few days ft hospitalizat n a d by mans of a barı me em wsf und t h leoc he I tus scept a ssociated with tum of the terminal ileum Th the patie th d a chron intu s pt on es lting from lymphosare ma f the cecum and ascending col furth p tent seven ye rs f ge rague abd m nal compl ints led to xami at on which re called I rge hard mass fill ng m t f th nght s de f the abdo m n Blood in the tool was the mpl t n th last patt t twe ty v m the of age wh had a et culum-cell sarcoma f the ect sigm d

Examinatio fth blood re caled no abn rmal ty in any of the 5 pat e to at the time of dimiss er fth m de loped the blood Termin lly h pictu e flymphoblast cle c mia

The operation procedures and course 1 th 5

pat ents were as foll ws

In the fo m th-old inf nt the ileoileal int suscepti a was ed ced th segm t f lum c tai ing th two small lymphosa comas and a lateral nastomosis a perf rm d Tw to

ght da saft operat n the fant up I ped the picture l'acutelymphobl st l'uc mia and died A M kal ez resectio f th t rm nal ileam co

ta n ng a large tum r was perf reed th seco pat t with an ntussu c pt on The turn t es te ded to the sigm d and root of th mesentery a d smalle tumors were n ted in the pro imalil m d jejunum Recurrent intest n l ob truct on neces tated a s c nd lapar tomy Roentg ray therapy (1350 roentgens) w s gi en Du i g th f rth week lymphoblasts appeared the blood means a d masses I tumor we n t d in the abdom n Th child ded n th thirty nath postoperati day Aut psyr v aledge ralized m tasta es

The cho ic colocol c t ssu cept n wa itt due ble Th r were many la ge y ll the ome t m do e was r mo edf r bi ps ileotrans erse colost my was p rformed Ro nt n ray therapy (600 to ntg n ) wa g en Th chl!

d ednine week after p rat n

In the fo rth case a large tumor of the com d asc ding col n was e nide ed to b i ope able be cause of its ate t nd the pres n of e larg ih rd mesentericlymph odes Abopsy f the tum r performed D ath occurred n the s t enth post operat v d y

A abdominop ri e l es t n of the rect ma l lowe mod w s perfo m d in the la t ca rllrge nod s in th meso gm d e The tum (et c I m c ll sar ma) lay in the ll fth ret gmod A tot I f 3 000 o at as w s giv na dthe pati nt was d cha ged vtyd ys ft

p rato The hid has r m ed ell f r fitee mo the and is the o ly r l th gr p I the authors opin comb at o f rad cal surgical e tirpat n f the in I ed intret mrs ntern fill ed by h vy oe tg ryth rapy t the abdoma i d m d ast al dras age ras of f rs th pat t the optimal h f u i al f indeed any s chichanc may h c lled pt m l in this highly fitald eas

FIFIR

mber f

d M Coln Stery Jim M 1 80

The us I lio mid std ed th cases fp nt n tis d fect n p rat n o the colon Good es lts e f m rly bta ed s es lt of the pope pep at fpt tf t least a w k pro t perat W th a p m pug a d l qudd t th c t t f th bo Withapmry we greatly educed In add t pet alf i a d blood tra si gn 5 W bta d h whe The best es its e

cours li th az le in I ge doses th tt : eff cts It duces th umber I col ! rm bact is per gram of wt toolf m ooo ooo t oo Th ht se th se eral-sta e Wk lcz perat n can be d cedt singl proced

Successibili theazol build be g en

gm pe kl gram of body wer bt f at l ta

eck bef re operation Col nic 1 igations ar ot necessary b cause the drug has the p operty of di m h the c ntent of the intestinal t act r dring it practically empty. The admit trat n of ca bulfath azole makes the use of vario s as ptopr cedu es unn cessary in colon to col n anasto SEL KAN MD

P ick R.M Jr Surgical Tre tment of Cong nl t I Megacolon J 1m M A 1945 128 4 3

C ggenital m gacolon is an uncomm n little understood cond to n v hich has ch llenged th med calp fees nance H chapru garepo t Littl is kno of the et ology of this disea e hence any pl n of t eatment becomes at once vulnerable to adver e entic sm. Nevertheless some plan of management is des rable and may po e useful even though it s n cessarily to tate The literature on the s bject is conf : ga d diff cult to ex l ate. Many art cles consist of isolat d ca e eports d se bing tr atment but they show follow ups of only a few month

I the pres ntart el the a thor attempts t c rre late his expe c n th management f ca es of cong n tsl megacol n n th the results of t atment f this d sea, in the h ds of others No po ts of ingle cases has ben i elud d The r sults n i pat nts on whom I ft lumb symp the t my wa performed by the surgical staff at Tula e Um ersity school of Medicine and the Ochsner Clime have

been compar d w th res Its follo ing the and other

types of therapy pre usly r ported I conjunct on with the study a car ful survey of the records of two 1 ge gen ral h p tal in h Olanswamadee vel gthe per od ith p tten years All cases 1 which d agnosis of megae 1 q estionable meg colon appeared n re caref thy reviewed Ab ut 30 such ca es were f und In most in t nees the d agnosis was n t establ h d altho gh th e was freque tly roe tgenographs evid nee of col edl tation and the cli calfinding v re ft n c firm to ; Usually a few days fcnrt e tr tm ti the hosp tal suff ced Th ub equent course of the pat ats s not known It is guin cant ho e e that th re w re only one r tw r ad m son to e ther hospital for s mil r e mpl int Fr m th s the a thor infers that mild forms of th dise e ist which reque special triatm nt niy

he unusual impact n ccurs The cond ten of the repatients treet d by sympath et my howe er definitely upp t d a d ag nosis of co g n tal meg col nin it e r f m pe t n was perf rmed f any d ubt as t th nat of the deas exist d if the med f his that m deal managem ntw ldpr sat f t nation both as t sympt m t l gs a d

th cond t n of the intest ne s met ith sev ref rms fm gacolon Th s wa id nt n th
1 patients tr ted by the a thor I to f thes p no need d latation of th gm id w th t f an gam to f the m g col was ! In the le enth ca e f m n.tra

He abn rm lty f th descend ng col n gmo d

or rectum was n t do rape i doff ur vers R entge ograph c studes showed the undlated colon to h a n rmal abil to expel m te al from it lumen The rem i d r of this patie t s col n vas affected Massive d latation of the t rminal il um de eloped later Ma y writers confirm the e ations regading the site and stent finvolem nt

These va ed clinical types of megacolon no do bt have caused cons d rable confusion in eval at ng

m thods of t eatment

The diagno is must be carefully establi hed ! adequate obs rvati n and study of the patient M d cal manag ment utilizing the sympath tic stimulants s recommended for a tri 1 of from eight to ten weeks Res Its with meeholyl b m 1 adm nist red o ally h e b n prom sing Ben f ci leffects have I kew se bee port d ith the u e of syntropa an at op nel Le drug heh act as a parasympathetic par lyzant. Both of these com pound h ve opposite effects S nee hoth r go I es Itsth w uld eemt support the often-e p essed c ntent a that a pe re n of the a t nomie sys

t m ; the fundament I fault Drug therapy must be acc mpan d by a ca of 1 reg m n t ad bow I functi part cularly in the m the of t atment I therapeutic test first ( w th cetylch line sp nal ane thet e sh uld b carried ut in ach ca Threise ryidcat n that the rape te test a atremely val ble Somal a esthe ia s definit ly kn wn to h e he e fic aleff ets which ft n pers stf r ometime Anes thes a ohta ned in this min er us ally result in a I g box l ev cuat on sometimes s veral such e acu t as with a th following t ath four hours This res it would indicate thit e play pow r e ists and s the ef r regarded as a good r act a pat cula ly if ampatheetomy 1 co de ed Whil the pre entst tus f information does twa r ht a d rm te op on the failure of spi lanesthesia to eff ct spontan o s evacu tion i p obably clor ly ssoci t d with falures i rg cal inter ention De T Lats wh has m de xha stive tudy of case fee g n tal meg c lo is f th opinion that an at phi d bowel will n p es t d th t preoper ati st des should dete m this f ctor If ad o cates the u e of a bar m enema f ll wel hy the i jet n of a spinal anesth te r acetilch l e br m de F ty fve m nutes lat ra film shoul I be m d to d t rms e the e tent of the e acuation that the u e of the drug 1 as er De T kats bel nd af r th n a sp nal a esthetic especially f r debil tated f nts Th auth bel s it inadyr bil to bject put ent less than tw done h lf years f get anys greal procedur u less it is a If sa i g measure C nservati e managem nt winth ghint e tirely sat fact ry is the tre t me t fch ce n ml ts

If them deal rgm n does not pr stafact ry and the age I three has been r ach d lift I mbar smpath ct my should be cons d red especially if rinal anesthesia prod ces a copious bowel evacu t n Left lumba sympathectomy 1 th s mylest

operative p ocedure that is a timable. In pat ent o er thee years of age the m rt lts s pra t call mi and the res its a cas good as a than per t method except possibly the m re extens

th t cablat one

Left lumbar umpathectom brings a relief which c mpares I vorably with results obtined hy mire perati ns In the authors seres of a patients all wer te ted in the mann randin th effe to ner highl att factors. Thee f the oth r pat ents w r greatl benefited but r q r d occa onal cathart es or enemas. On cas was a c mel te fa lure b t this result was not unexpected 5 nee the pati nt had in olveme t of both the col n and the I um and a sp nal nesthet e bad had btil feet pre perate 1 Af llo upst dywsm deong of

the patients f r from n to el en ars The th we en t lollowed up lo as long a pe of becaus n th ca e of the tr atment was a complete! slure nd the oth hid dedfom n phritis thee m pths f llo mgth perati a lite appa entil h angle a ent r ly well du 1 g the three month pe 1 d The auth a report h wathat on per cent of the patient

e greatl b n fited Th re we e no deaths I om the operatio although the patrint ages ran d om inht nm nths to fifts t oge is Roentg n ographic examinations in de at amous interval postoperati el indicated that while the bo I did not become no mal the e was less dil tat n and rete t on th n at the time of the origin 1 st des

Results of lumb sympathect my eported: the I teratu e indicate that at fact to fu ct n : obtained in the gre t majority of pati nt. Con.e. quently it wo ld em to be the poced I cho ce hen med cal t eatment has been in ff cti Sh uld Imba ympath et my la lit becomes eces ry t th neht d c de wh ther the 1 ht lumbar ch planchnics should be rem d These operations

can be done in tages

Fal etoganan mpovmatalt littlm r gan l nectony might be con ird sed e that furth t mpathet es tg cal mea u es te con traind cated but some mp o ement uld w rra t bilateral perat on If bilat ral gan 1; t m; fails t show impro ement o e c rt h hes tates to d m re Re ct n of the intestine is a h za d

operation which has been ad cat dib man geons The ut o bel es that testinal esect n sho ldb sort dt o l aft m dealm ng ment es p

and sympathetic subcal m nturel Rem al of the ntest g es best result old pat ts and n thos with in al m nt f

small am unts of intest e At THE S I S PERF M D

Scott H W J and W re P F Acute App nd cl tis in Childhood I & S t 94 5 During the fi dahall er penod f m

1939 to J ne 30 1915 th ha e been oo child a vith acut append citis t exted Th Childre s Hop tal B ston Fifts pe et f th patients w emal a d4 pe ce t efemal

Examin t n of the relation bet een the t pe f appendent and age f the pate to sines t port the vew that perforat o of the acutely flamed app ndix tends to occur ea l r in the c une of the diseas in bab es a d you g eb ldren than persons in later life In ch ldren und sav ars ( ge perio ation was enc unte ed m r th 1 ce often as mple acut append its ith ut rupt re It has lo been belt s d that I ct ns of th unpe respiratory tract bear a d fint rel ton t anped t ad that the latt the sits ge test de c d rng th so-called e prat ri s Howe r there wa nost k gs a nal a t th med ace I pp adicit i th fi a d half year period By and l rg nthis sen's cut appe dettis d ipdr ther sudd nly in chile wh

had bee well pe usly In 66 per c nt f sp came s exhibt ng perf t tion lecal th were pese t A ther la t m y pred p set th d el pme tof acut diet i hidra i infet on of the i pendix th pinworms (x) ris 1 rmt ularis) These pa a tes wer present t the app nd ses of 60 p tent pr s nt ng the clinical picture facute ppindet.
In a child the app diss sall ling riss to to the sie I the perit alea to a dith c cum is f quently m e mobile th n : These to 1 ctors perm t mor d pr ad pe to n al contaminat n t the t m i peri at add to the m ntum s f quentl h rt s-d d Hat nd so und rde l red a le lie that it ffershttle r opr t ct o a nst sr e dag pe

Wh n pan ca b accurat h l cal d t most apt to b g n arou d the umbil c s with a later h t to the neht lo r quadrant f th bd m n de lopm t ip sapp nd ts las ad m it gre nsta t symptoms n h lithrod app d its and usu lly occ sbqctt ntfp Temp ratures ffrom so t 1 F usu lly c m p pappend ts childr thy rab c eps pt ts ith p lorat nad prinal of met The bo Isu Hyrt mal but o tpati np rt and du ga ttack 6jerc 1 fannendet semm n occurr f th uth rs m ten ! Darrb ccur 11 83 chldra ( 6 per ce t) alm t ll I hmh deith spead g pent itis tapli ppnl ts most Iten with be ess which esult ding tat fil mm n ccu am d Lnary \mpt m r ring no h 33 chilir na th gr up

to its of pp d calo g

Abd mi alt 'tres i the miste st t bpect es-a laqestio blitth m t 1 bl e the dura Ipp detis baab 11 o ly 2 fth 5 6 pate ts Rect lt d mes sendre t mm physical mil ted nith Il but 5 ca es i peri rated s nes ber pres nt ppe dates d be nt no b 54 ca es 1 impl acute appe dcts-a mb ed f f 87 pe et I l tary pam ith t muc fon din 64 pe ce t of all ca es fu perf rated mospe ce t fth cases fperf rated ppe d ta

In the diffe ential diagnosis of acute appendictis m children c must adequately exclude gastroen ntuberculous mesente cade terts to stipation nts acute pyelo ephrit s bronchopneumonia pnm ry peritonitis Rarcly acute rheumat c fe er scute pol omyel t s d abetic coma and synovit s f hthp may be c nius ng In babies and young chili n intussusceptio and the symptoms of acute of its med a may occasionally he mistaken for appe duritis

The tre tment of cute unruptured appendic t s in children by imme I ate appe dectomy is the procedure fich ce Del yel perato or ochsne za ton res lts : d ath from p tonitis b fore a local urd abscess can b formed in a prohib t vely high pe ce tage f cases in childhood Conversely f ea h p rat n employed for children ath app n dicalp riton t switho tadequate p coperative p ep arat on many unnecessa y deaths occur from

S c dehydrat n a d ketos s are s common es en child n ith early appendic tis preop ra tra ous a lministr t of de tro na oto col to is dum chlo ide is u dr ut ely by the uth r F th s r usly ill child a with Potntis ac st tint us drp s theif's of pl sma as il as of de t se d sal esol ton S'dum sulfadı e 15 g n pare n initial d se f (og gm) pe po ni (5 kgm) f body w ht lrsp co tant gast ic suct on by the Wa g st m thod morph e in three to fou hou doses high c ce trat on (95 per cent) yee c mpl t

The decis n s to t me i roper ti i thes cases sb ed ath esp se of the patient t th th apy thimpro ment hacl calst tasse d by his gineral pp ara c as g fe nt red cti t mperatur and fg at st import ce a ot 30

per mi ute decrease n pulse r t ith imp em t in its qual ty

th therapeutic egimen

The appe dix as r m ved at the init al operat n in 47 cases (93 per cent) while in 34 cas (7 per c at) t as d med 1 advisable to do m re than tin and dra ge Of the latter cases 3 w r later admitted for interval appendectomy

The ch ce l'incisio l'appendect my ch ld tend pends o the size of the child d the type of appendets Becuse f the small a a which p ents bet e n the line sem lunaris a I the ant r s pen il c pi e n young childr the McB rn 3 Lc n may g e1 adequ te c pos re part c l ly of plic ppc dies The auth rest cts this or n largely to lder child with early ppe dici tis and will I cal ed to demess of the right I e abdominal quadr nt or with retrocecal ppen I citis and uses it as a m ns fe traperitone I dra n g f a ppend cal abscess The right r ctus nc s on gres c cell nt xposure of the app dix 1 ch ldren The min mum retract on R tract on of the rect s "scle is p I rable t spl tt ng of the belly of the muscl since it insures a stronger w u d As medial retraction easily d mages the nerve supply of the muscl the author has r cently employ d lateral

retraction almost e clusively

The authors h leve that dra age of the privis i d stinctly useful i childre with p rt nitis f ap pend calloring n. He uses soft plable rubb r drai s tral co of gauze (Penros ) The d ain is always led d wn into the polyis along its lateral all and should never be placed among loops of boy clor

aga not the append cal stump Int ape itoneal administration of sulf am ic c mpou ds was u d in 72 appendectomies for per fo at e pp ndicits thabseess or perito tis 67 of these cases a drai as also employed Sulfa daz ne as used in 50 cases sulfanilamide i 17 an l sulfath: 1 n 5 It ms to the authors that th

trape toneal use of sulfonamide compounds offered n great ad a tage ove the oral or p teral use of sulfath azole or sulfad a 1 e reduc ne

the 1 e dene of these compleat ons

The import c fa well plan ed postoperative r gim for children with appendical pet tisca be overemphasized. Bo e marr w infusions ith their inhere t da ger of o teomsel to peri ste l st pp g and s bsequent sequestrati ra ly be used Pr caut s must be observed t avo do c load g the chid w the cess e sal e I to s Repeated small transfus ns of fesh h l blood e helpf I for crit cally ill chil fren with p ri ton ts If suction d par teral admi istrati n f fluids are n cessary for mo than to r th ed ys lut as of ami o acids sho ld l id d t th

parenteral feeding reg men

Ch m ther py was administered post peratively 8 p ce tof th cases f perf rated appenicts this s es Sulfath az l as used in 82 ca es a d s lfade in 1 99 Both drugs s cmed ff cti e 1 dim ish g postoperative toxic ty short ning c n d reduci g complications but fe er

rea t as to th drug resulted with sulfad azine There were 8 deaths in this ser es of 506 cases an ve all mortal tyrate of r 58 per cent

J S PH K NARLY M D

B gly W R nd B gt y E C Si osl of tt Sigmoid in th N who n M / W au 1 W 945

In 1 f nt was operated upon fifty two bours aft r h th fo co en tal stenosis of the first part of th s amo d A colostomy was done abo e the obstruc d a sm ll catheter inscreed i t the pro imal nd of the bow ! Following this the old McCraw meth dof at st my with necr s g pressure of a rubber h nd was do e and fi ally when the h by was five d half m uths old th colost my was

From this experience in a patient the author con cl des th tap limin ry c lostomy in this type case seem t be good pract c If there was ad quat m blty f th bowel h would use the Mc Graw ruhber h nd ecrosis colocolost my at th original operation. SANCEL J FOG LSON M D

Drawtrok, E. T. Condenital M. If rm el n. feb. Ann and Rectum A Clinical Study A k S r out to str

Cone nital m liormatio of the anns a d rectum ar said to occur about a fe ery coop n whore habes Anomales of the annis and enture ar el su fed by Ladd nd Gr ss into a types as f Il we (1) incompl te ript t of the anal membra e reste our at a no nt f om r to 4 cm abo e the anus (2) um perf rate a us with the ob truct on due only to a p is stent in imbrane (3) imperf ate anis in high the ectal pouch may nd blindly eth rin ab v the pely (4) normal a us a danal nou h with th retal bouch end ne blindly Th tem y beeth ra m mbra us obstruction between or a separat on of the anal and r ctal po ches. Wh n the nouches are en rat d cord of t ss e without a lumen oc ca o ally my con ect them

Fiftee n t ts with o gen tal malformati n of th a u and rect m n re studed by the autho Of thes r pat ats s (33 2 pere at) had f typ 1 nd o (666 per cent) of type 3 Th sex distribut n sh wed a males and a female with a m he of type r and 8 males and a females with

a om les fishe a

Fi e of the patients w re f u d to have fi tulas co meet no the factum with the genitournary tract of penne m T types of i stulas were encounte ed in the males ar rectovesical and r et utethtal re tonermeal fistulas we elou d Of th f m les s had ecto ginal f stulus and s had a ectum fossa navicularis fistula A rectovesical r et penneal r combi i ecto aginal a d ect vesical fistulas n r encount red

Fiv p tents h d other a soc ted c ngenital nomalies. These nelided absence f the gall blad de horseshoe Lidney had our te and hydr ne phr sis p tent d ctus arte iosus anom ly I the ret rs hyposo d s an unusually i f rate n

ale and me g h n docs

The t atm at for the type 1 a omales w s satis f ct ry h t th t for th typ 3 a om hes w s un satisfa tory as jud ed by the in rtal ty in this gro p B sically the prod ct n of colostomies fo pate t with sympt ms f i testi al ob truction nd the perf rma ce i primary permeal pla tic symptom pro ed t slactory Tw pat ents who had u de o e p mary permest operat ons d ed of o not not s as a result i perforat n i the rectum a d c ntaminat on of the pe to cal cavity These w e techn cal cc d nts The 5 pats nts p escutin

bstructi e symptom a d pon wh m colostom es performed died One p tent with type 3 g om ly w sg en bar m s if te meal as a diaz st c d This is co traind cated for this co d tion will as I r any ther type I intestinal ob-

t uct n The cho e f esthesia for infants i I m ted to eth I calord peth nesthesia The latter was used in all of the cases acept a in wh h local IOSEPH K. NARA M D a esthes a was u ed

Smith G 3 S A Modificati fa Old 481nl M thod I Treating Rect | Prolance V F el d.f M 015 232 405

F e cases of rectal prolanse tr ated by a mode eate nof compress on amoutate nate tero ted. The author states that from a re : of the lt ratur ould conclude that moutat o of retail proc n tize by constrict on is not good D ocedure a nee n the la t tw nty se is the e have been a operat deaths mone a reported cases. This has also bee cons d rabl morb dits as well as rectal ste the period of obs rvat on has be n lo them thart too shirt to decide about the ne man new fence & fat ly complete revew f th lite t f f the lat fourte a seaes leads o e to the same co ci i neo erns g the variou other m th d of treatm at both abdominal and peri cal. Eth rith morbidity r the m rtality ; sim lar the e ah h rat of r curre ce or good results ar based n too sho t a There is dince that s period of observat o great amountation h s lided the heat equite a th nast

The 11the suggests that the mortal ty den e bid to with the co sir ction meth do preat to ha come from t chrical erro s d that this method ho ld he just as effect v as sure cal amoutati with the advantage I be g mit h impler pro

ed e The n oc dure desc ibed s med th ga d h se t hnique Old r methods fachi v gc strict o mp tat involved light res o class c hands a d rubber t big. The o ly orgal features of the present method t the cutting f ci cula groove in garden hose t b ld ne un a tro charou det dapplying drast compres by twist pg strong m lie bl c pp wr a nd th protrusion 4 et cula groo e 5 cm d cut d enly 4 cm f om the dof the h to b ins rt 1 into the ect m The rectal sleve de dout to its fill gth and car fully plated fo the pes of sm Il intest e : th hermated pou hof D uglas With the adof lub cat ng ; lly the how i tell so that ts groo ec mes ju td st lt thea alm tu Comp ess on 1 th bowel againt the groom the p odu ed and t p vent th too ea ly p l of th hose th end of the p slap cl moelt th out end of th tube

The mu m 11 ss f blood and the hort t m ou ed a e in fa of this tech igu a d succ nyl sulf thiazole has em ed its gratest d g

n m ly seosis

Technical rroes which ppeart have thit! to the m rtal ty d m rbd ty f ll w g the c triction method I treatme t r

The bose is in erted too far bo e th po t constructio which il with ecumulatio i feces tad the ect m Pristals c ldi ! some of this mate all through weakened a 1 th hould be tm etha f we t tassues Th m ters of hos abo eth po tof c mpres has n t probabl that in som cales transul t

been compile which permits great sept a d

touc absorpt on A slight increase in the damete f the hose might have reduced the amount if te o

bich f flowed in the author's cases

I cases of reducible rectal prolapse in women th procedure has been safe and the res Its in 4 cases have been good fo periods arving from fmost t o to fi e years I the fith case prolapse has twice recurred after t elve and eighteen months re p c ti ly of temporary cure It appears that there will be a una o dabl pe centage of recur ent re taf JOHN L L DOULT MD prol p e

#### LIVER GALL BLADDER PANCREAS AND SPLEEN

Titlb m M Curtls A C ad Goldh m S M Th Comparati e Valu f Sev 11.1 tl n T ta A I t M 1945

Eghtdff e the funct nie tsverep fom d mat ly the am t m on ach of 53 P t t ith varius type of s si eted liver d a admorthan spesntddeft eid nee fer

thosis a opla m o hepat ti apg m at f med ly the bacters lr ducts f bl b th i testin A lag pat f the u bil g n form d is ever t d i th stool S me i abs l i f om the intest e d econy rt d by the l er i t 1sm il mou ti e cr tedi th n 1 the pesen e feellular he dase tham nt f a con ert d robil nogen in the blood ner as d a d is excreted by the kidneys B ca f ti n created a xe etion of urobil n ge by the kid evs in some forms fl er d a its qu t tati est ma in th in may b f value 1 dt mn g the presence a d at nt f cell lar l ver d a e

f uing the t t t f ct rs m st be r mem be d (1) 1 pit fin malh patice flul act ity th m b an ab o mald gree fin bil g u mass er t d ith i creas d blood de t ct n and (2) the normal is e ca t con t an abn mally is ge amount of blood p gment nt b i rubin at the usul rate In chonc renal di ase alo the test is of noval e beca se the diney can tee te th p gment Of as s of 57 ca e ith defin t i erd sease 75 4 per c nt had abn maf excreti n of u b linogen f th abs nee of obstruct e jaun d ce a din cases i which other ca ses f urob l n g au is can be ruled out the p se c of rob Lang n in th rin i dil tio sg ate th n 4 s gn heant The test s as I and rapidly pe form d a d may h lp n establishing the diagnos of l e da ase Becaus the test is roughly qu ttt e t also has v lue in determi ing the pr gres I th 1 rinjary

1 den B gh e cls of bype b li The pre tub em i al ays important i li r d seas a d the quantitati I a d Bergh r act on the most comm nl useds glel er l nctio te t P th log cally h pe blrubi emia mea s ther n obstru-tion l the bile duct an nablty f the pa n thym 11 cells t xcr t all of the ble be gbt t

r prod ction of b fe pigment from bloo l d structs n greater than the I ver can excrete fn obstructive; and ce th characteri tic color occurs promptl pon the add t n of the d azo reagent t the blood erum (direct reaction) whereas in hem

lytic ; nd ce the color appeared only after alcohol s added (ndirect action) The hiphasic or de

layed direct eact on indicates both free and protein bsorbed b f rubin in the blood stream and suggests botbob truct nof the large bile ducts or small intra hep to chan els and red ced cellular activity of the fs r The I ande Bergh reaction is of gr ater value in det rmi g the am unt of ; undice th stim t ng the p esence d sev rity of his r di e se a exte s v impai m nt of li er function may x st ith ut i nd ce a d severe ja nd ce may e st tho tf er damag Am ng 58 ca es of h patiti ne pl m and cr h s the eact n a poit e in

51 7 per cc t
Gl t seller celst Galactose h s been chos n a bstance t ma e th carbohydrate fu ct n of the life beca there is a nalthresh ld for it c t th ndoe glands ha en fi ct nit met b fism and it is n t util zed by tis s the

than th f e Trty g ms f powder d g l etose gi en rally duri e specimens ar coll et lat hat real fo he hours Wt may b taken feefy dung the pe d The sures miles re the pooled and the m nt of sugar d termined by th q antit t e Bened ct m th d Ir m th i cal cult d the m nt of g l ctos n th ur ne \t tal elmi t nol 3 gm orm e f galactos is an d cato ffverd ase The test leasts t facto y in d te m n ng h th r or not lie de see it It mi aluei the diffre titin fadiffue cell lar ntrahep to fes n from other types in wb ch di as is det an xtrinsic obstruction fn pt nts th con ife bl jaund ce the test may be val ble a fy in the d seas When jaund ce is d e to h p tits a positive t st is troof of cell lar damage Th test w spost ein 20 4 p cent of 54 th k own lv r d sea The test 1 not p t nt v I able n det rms g th pres nce or abse ce of I rd Itis mo el kely to be posit ve in diffuse c llui r disease (h pat t s) w th ja nd ce than in ther f ms of 1 tin. clv r dis as

IIest B caus ne f the mair f net us of th l ris the convir n of glucose t gl c g n dth n storing the latt r hep tic d sease m s n m nstances p oduce a d turb nce in gly cog nmetabol m Wathdam g toth h er the stor g of glycog n m v be considerably imp ired and exce leab hyd te 15 g ve it accum when lates n the blood st am and is exer ted by the k ! neys The pesence of a high blood sugar tim I tes tb pr d ct on of insulin and the incr a ed c mb s t on of glucose 1 dd tion to its loss th ugh th k dn ys may res lt 1 a hypoglycem c r eti n d ring the third fourth fifth ho raltera h gh car boh drat me f

The stand dom the dwas mpl y dwith 1 reem f glucos pe k l gram of body weight. The gl cose t lerance burom 1; 04 per cent of \$4 pas tin 11 it in the tet begans with a nrm 1 r low in tin 11 low or end of uper he he nera drag the first or end ho is to al. 1 high than nrm 1 and the niall to ah pegle come led but get this to a first test in a man home of leade tet fill er deach not the glucor tiran tet in a man home of leade tet fill er deach not the glucor tell and tet fill er deach not the glucor tell and tet fill er deach not the glucor tell and tet fill er deach not the glucor tell and tet fill er deach not the glucor tell er lid each to the rir umport ni nd firent atm high tir fill not true in a decention to the second of the second not the secon

Se bt I dive All d rum n te it tm nat on - Ar d et on of th I velof mmirt n hal ntdnl rda The ru l mn most oft naff et d a lth el b uln m v l l td rum lbumn und r 10 em ne c t con i d bn rm i Of na t at then all Serve cathen it Ith m thumin I bely 4 gm It at | r that h p album n ma a re 11 de f rda I pec ll l tfe nideatr Irdaaltnol deho-liim in lifthy no rat neoffando BTkt lrit - That dernidelsat hn h til lim pt nt th lot rin u 11 1t | 1 n f od m carb nate hl i a daeidf ch ap ptt f mrt rd Thith b In ton test The tal erum pr t nt tila n 1 th at nt ngd ned at rath glbl out t fth fld Th tt st nsspretofs6caes th

If it is miller moth miller moth miller me de miller mille

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n min Th test was positive in 55 2 per cent it cases with kno he do see it quild in shublem stypes of it do not cate of storie here do magnification of storie here do magnification can be miled ut

In pate at who r pau d ed th best tests to se f r th estimat n of h pat c f nete n are the s run

It it estimate not heat of note name the sum poten a determent of the old men melantite gleoset leance test la pate to heren tau deed the bettest to a the bemilfind e \*\*Excetonist notify who leantite

Jhasa W M a d Da i O T Pa re thi ta An lys of 22 Cas s 5 th 11 J 94 38 313 The degree facut fac attuit a luya the clical p tur plus the light in 1 th

the cheal purplies the inting in hit described resistant with an in pull rich die fan mag Ijac.

With the birt in fith coted ethic hit at it to nut pies att the art

tak ten ut preat the aft fthepane tejet thip herepilns all the claim Whithene te fall tip at fint the lood libed dmil tho mostqikl alal lmittd

The mimic entry fith blads rum
ring in Sotis megant per one challs bood till rm!
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m it kesplacih fhesadea faltt m ir bim tmes thestha tetfhes Thathd tiiin attias

geat meg In thin jet leaesth leem ith it the liofpa to L

nted the dt i rebond indemess. The on nal dagm a scute calculou chi lost a donnervat e mana min w matt id The pate if field i mpoed in the such hop tal day wa operat donn with a people dagment defects buts.

At perst the gall bladder a d blary tract wr fee fany flamm tory pocess b t a large

abscess of the body of the pancreas as found h ch as nesed a ld anned The quadrat l be of th l er on the infern urface bet ee the first magnet ta d the gall bladder was bulg g and ps a say rated from this lob of the li er Th 1 be to less dand two abless cav tes we f und d

The postoperative conse was satisfied by and the patin at had not de eloped diabet s mill tus three months postoperatively. The authors interpatible supports e pa creatitis as secondary to a sub-homering chapter at the particular between the patients of

Whipple A O P ner at loduodenect my f Isl t Carein m A S 1 945 847

The author r p rts the first reco ded on tage removal of the head of the pane eas and d oden m with occlus n of the pane eas. This ope it on wis

performed March 6 194 for an isl t-cell carcinoma of the he d f the pa creas. The patient has surel file years thout endence of recurrence f

th tumor

The author favors the one tage p or dure ove
hs earlie t ost ge procedure reported in toas

He ha f und the follow g two steps of g at advan t ge r The implanting f the common d ct int th j junum e the d to end or end to-side ccording to the ch c of the loop or Roux type f jegunoje junost my. This avoids the figr f a cholection

to the en c of the loop or koux type I jejunoje upunost my Th's avo dis the I mg r I a choice is to enterost my and the se ous complication of a bil ary fist la as a res I to of the cut ring th ough of the I gat at the I gated common duct a The unbainst of the pascreated ct. t. th

The implantat of the pancreaticd ctit the jeju alloop blwth chole loch juin stomy. This im ates all the uncertaty and dbtergrding occld dpanc as and poble fatty lie degeneat

## GYNECOLOGY

### ULEBUS

Jeff oute T N A nd Le r S Hypopla is of the literus with Special R ference to Spasmodic Dysmenorrhes J Ob t G B t Embs toes

The authors p esent a cnt cal n lysis of himo pla a of the ut rus d to relation to sn mode dysmenorrhea This a aliss shased on the case cord of 8 a p t ents compla 1 g f dyste no th a Only p tents with a typ cal h t ry f spa mod pain are i cluded. All cases n which associated less nsof the ply a pes tae xel ded Of the 8 opt nt 43 weress l nd 383 mar

ned O hund d a d n nety five wom plained of steril to

The onset of me struction occu ed within normal Imt in in st of the cases O ly a per ce t of th pat ents had scants me struat n and the e sa ers I w c den e I nfe quent m nstru ti n in

the goung enem d

M stof the uterice e to 3 inches ind pth S me typ of in nor de lopin tal b orm l ty of the uterus was oted in lar e perc ntage I th cases acut antell xion f the certix was found in s68 cases on enital etroflerion nd ret o rs on n c cases a d conscal c ever with or ithout n hole os in an cases The auth es co clude f om these fion es that it s th malformati rather tha the der ee of d velopm at which is the fict cau ing the dysmen rrhea

The endom trial n it ms we e studed in only t cases. Howe I the auth is stated that the I findings prorted the vi w that menstruatio cha

In this s es of 8 o ca es i so sm die dysm nor thea defin to evid not f ute me hypopt sia was f nd monly 15 cases a din s twas quest onable

a inc denc of a 18 per cent A discus on of the therapy of hypople six f the

ut rus with estrole is at en

ummary the authors state that the pa pasmod c d men r bea is related a sor way to contractions f th uteru The diffe nce between p inf I and painles contractions lies in the r char cter rather tha th it st e th. The theory that s pooses inco-ord at n of different areas of the ut rus o disturbed polarity I the ut rus to be the ca se of pain dura me tru ti has till to be dis pro ed Also the is not at p esent en ugh evide th theory which or disp uterine hypoplasia to b the cause f the abnormal HAR FIELD MD ut rine co tractions

Find! D EndR Its in th Treatm at ICerri 1 0 05 1 40 6 4 Two hundr d and forty cases of chronic cervicitis

w re treated by the three generally accepted m th

ods of elect osurgery namely has I tip caut his tion electrocoar latter and con rat a H t l m cal at des we a mad before treatment and after healing was of nically complete

Comparisons were m de as t the te and type of heating foll wing each the are to measu en dal o as to result at complicat as The a reer tes f heat ug we e the same with Il three meth d

The ne centage of att fact ty results as greatest after el etmenagui tion hert greatest aft e con es tin ad I st I llowi ca tenzat ra little diff e ce between coamilat an indea zati a the nd h t log cal net I brou t

e ea tio was ers low ft r th first two nonce d es h t lightly g eate f llowing caut zat n Thee maleat s heh emiste mm alven counter dwer hemorrhage t os a lov m tra a d er most fequ the en follow g con zat a oft oth das at th tm fs pa ti nofth si gh Stenosis with resultant py met a may be la cely p

vent dby r peated dlat t n fthece calca l Carci ma was disco e d in a ns pectel ea es among 21 g m ned Internal t mp n w ef d to interf e with p oper healing. Their e is t be ea d m ed EDWARD L C R TILL VI D

### EXTERNAL GENITALIA

Canberg B L P stmen rous 1 Pr ft V f Am J Ob 1 045 49 647

The theory is adva ced the temost cales of post menopausal prut tus vuly e are has cally due to a local atrophy if the skin. This pe mits an "asion and infiction of the demand the sal pathor sic skin & n sms which are al a s p es nt in that Th ses it g a fla mation aff to the nerve terminations in the pap line of the derma and pr d ces the itching Th mac oscop c and microcon c p ctures a e la g ly d term ed by th 1 de aduals def use fact as Th same stim ! which will esult in I chemificat o i no nets will ca I meonlake man the The best m thod fobta n ing f lef is to p teet the kin from any furth trritat n by the consta t application f a bland ontment f at last three m aths

An adrog me outen t shuld be u d locally in those cases which in bit evire ul lat ophy

The s cessi I tr atment of 4 cases of sev re present a pausal pruntus vul ac a which p this py and post th rapy vul al b opsies w e ofta ned

a eported F've of the pat ats had leucoplakes of the vul 3 EDWARD L. CORNELL, VI D

S k W Tilb ry R. nd Coll y J Go orrheaf V gialti J Am M A 215 5 50? The auth is p esent thei apenences with dose pe cili teatm tihng rrhal

mitis in 16 children Diagnos 5 was establish I hy smear alone only if the case was clearcut and gram nerati ediplococci were found in pus cells otherwise culture was resorted to Thirteen cases had recei d sul n m de and/or estrogen therapy prevously Pen cilin was administered only afte all other types of therapy had been d sco tinued for o we k

local or s stemic measu es were us d w th pen c ll Followi g one i ject on of 100 000 u ts intra muscularly cl cal nd bacteriolog cal cure ascer taned by the n se ce or absence of vag n l d s ch rge smears and cultures respectively occurred with a three days in 15 cases. The remaining case r quired further tr atment with divid d doses of pe ilin The single-d se method produces a rapid cu e with maximum s fety. Ho nitalization i WARRE R. LLO MD requi ed

### MISCELLANEOUS

Coh A T yi II G Jr nd Grun t in I P icillin Freatm nt | Sulf namid R istant Go ococcal Inf tin to the F mai Am J 061 945 49 657

lar us am nts of pe clin e used in the tre tm t fro8 adult f male pat nts ff ri gf m g ococcal infect ons. Of these of he defailed to espo d to at least tw courses of various sulfo a m det the r mani g 7 pat ents sh w d a definit

se t ity to s If nam de compounds Of the total f 8 p tients 99 promptly h cam bacter log cally egative after one c rse of peni ellin t catme t a d g by the administrati to doours fpenicall n

The results obtained by the administrat in of van us amo nts of pen cillin por t to the fact that a m numum dotage of 100 000 O fo d un ts 1 ] ted intramuscula ly in divided dose is h th nece ary als ffcentf b eterolog cale Th min m m total per od of time required fo s ece f I th ap) was i nd to be si hours Smaller d es i pe and she te total time of treatment ere d quate ; ind id al cases but this type of therapy ca

recommended Lt thral d cha ge follows g penic ll n th rapy d\_appeared with n a week cervical d sch g not ppr cably aff et d in the m ; ty f ca.es Acut symptoms and s gus of adne I in I em nt s bs ded w thin one to two weeks afte pen li treatment There wer 3 case which b dan accebation of the ad i molemnt mm dat by following the u e of pen cll and pat nt wh develope is ip gitis following ther py

After the disch rg from the hospit I 8 fth t tal f ros w m n were followed up fo an period of f ty thr a d s t nths days d ing hih an verage of 35 ami at n were pe f rmed F fteen pat ents were found g nococcus posti alt ran av rage f llow p of fifty-one and even tenth days It may be ass m d fr are s reas as that all thes patie is represe t reinf ct ons rath the r cu rences No seri s t xic symptoms appeared in this gr p of patients ticated with E WARD L. COR ELL M D penicill n

Maruli T B Fail re of Cure of P lvic Infections foll wing the U of P nicillin A J S f 945 68 336 F freen patie ts ith acute pelvic inflamm to y

dsaem followed up for t least a year by the author The t atment c ns sted of liad azine f l lowed by pen cillin in tot 1 d s s of from 500 000 to 600 000 O f rd units This co ree was follo ed by two add tion I cours sofpen cill nifthe e was no re I fol the symptoms or change n the pel ic path ! ogy In Il I the ca es th regime was c n id red to be nsuccessi i h cau e the pat ents all had b th

gns d sympt ms of resid al chr n c pel ic i fimm ti n

Th autho concludes that in spite of the fact that penicillar a specific for ma y f the organ sms in lyed in the p d et on of pel ne inflammatory dis is not al ays successful beca se the e se its ret n of the structures t th ir or ginal condition is not ecomplished J R WILLSON M D

Carri gt n W J Acute Surgical Diseas of the Femal Ptis J Am M A 945 t 8 434

Th author presents the esults of a five a gratudy fall f m le pat nis admitted t ne hosp tal with acute surgical less as of the abd men d the pel 1 The accurate d agnos s of cute urgical legio of

TABLE 1 -FEMALE PATIENTS WITH PELVIC AND LOWER ABDOMINAL EMERGENCIES AT THE ATLANTIC CITY HOSPITAL ATLANTIC CITY NEW JERSEY PROM JANUARY I 1016 TO DECEMBER 31 1941

F aldstron	Tot 1	Ten w	P ten
At ppedati		778	
A tad xuu	95		
Acut less as Ith n syt t	5 6	39	77
F d m tnosis		58	90
Il mas, trangulat d mea rat d	7		6
tthese re t bd m nal	53	5	90
Apt deyt gash fill np lt m dem dese do-		•	•
m ci us and p p ll ry cysts R pt d ct p p g y	5	31	60
cl ding rupt red t bal pregn ev			
and t hal borts	49	8	57
Trs: It mars solid yet c		7	47
Pi cell hts	5	12	86
Mese tn dmud tm lea	•	•••	
scaltl gland l (e)	8	۰	0
T berculous pen natus		•	
M tt Ischm rz	ž		
D ruculitis	9 7 4		8
Torsa Ith om tum	- 4		•
Mese t ne thrombous	3		
Reg: nal ileitis	3		
F pt red typh d k			

the abdomen m st f necess t h made ran dl P Immary diagnost c proced res ma jeopa diz th life f the pat ent The al of ce tain In cal sensands mot ms cha th post of the na tent temperat e n l and respirati th l cal zat n f t nderness cutan us b neresthesia mu cle p m hd minalm s es ndabdominal aus cultat n 1 dice ed. Th. uthor concl. des after p esenting hi tatist es in tabl I c cern ng the c curacy fithed ones that a mo e the ough consid ration f th hit ra nd l th ph scale ami a tion will incr the nerc at g f corr cr days es made I RO ERT WILLO MD

G rdn G H Fernal Inf rtil tv J 4m M 4 s 8 2.

The major ty fichildles m sages do n t esult from nah I test alit eth anth h ha dora th wif they are in tance of rlt e i fertil ty h o ght about he a mult pleate of I ctors in both poures Mor than half Ith hish dam te ther hate r ecept f lire pon ibil to f r ch lilles un n A ph scans examin tion must b th ough a d sh ld n l de () a c mpl t general ph sicals r e () a ear h f gros abn malites in th fe

m i gene t tract (3) ane luat nofth m l facto (4) st d fth te 1 ecerva (5) test gof the o duets f not not a d (6) n in est gati a I the endoc me yet m

I physical e m nat n sh ld e al te

thel n t nofth glands of ternal secretion.

The lo erg nit I tract sheld be varianted for n f ction cerv t hould be look df and th pa t ner I the cervix should be test d. The iz of the uterus should be d t rm ned. R t. d. pl cem nt. f. the ut ru with anter tippin f th cervix a av I m the seminal pool has be n remphasized

Endom triosis is a v rs f ou nt rau e furf relaand h ld be su perted when the uteru is et a fixed a d fi. ed the rames e I reed and adh and wh n there a c tin firm en t enoil ! . e ther the cold sac up the rectorar pale of m o on the ute osac all gaments. The auth dults th tuter ne fih id a e often esnons bl f rinf tin

Ex mination fith sem ni very moo tant. The sem na plac d a elas co ta er at room t mrer atur Th coented crite Io n mal pecon n am at fr mato ace number f pe mat zon abo t com ll ne cub c cent met m t l tv 8 be se tacti ely motile and migrating troom tem perature morphology so be or thormally from d and finall n m re than an occas onal leucoc te

t d blood cell pe h gh po field The p tency of the o duct set mad b m ans of cathon do de eas Norm II a press r h t cen to and Somm ho and not fithe tubes npat cyas p dat presuebet een 18 ni 4 times the tise in days follows gith minstra to pe tod Lipiod 1 sict as es ld mind cated

Then te am ton the Hi her test Se ral h es afte int en rie the end cervical m cu should on tain from a to as act ely m t le pe m t oa per high po r neid

The final d g ost c step is an end cr Of gre test h lo is the mic osc p c ppe ran e fth dometrum within a f who is aft the first sh ol menstrual blood

The phys cians blg ton is syst mate limin tin feach and n contrib tig cau e that may
b f di both th hu band a dwife who mu t both co-ope at whol h tedly

C HELEDIE B II

## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

K g G a dRid L T Tl Rel ti not Vit min B Defi i cy to th P egnancy T mla A St dy 1 371 Ca i Bertheri Complicat g P eg a cy J Ob t G<sub>3</sub> B t Fmp 945 5 130

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5 some g est on rega d g the tubular enith lum m ce tan ra Acc d gt th d scripti ns f Castlem h and Smith 1 th nicture was that of moderately advanced renal vascular d as and w s

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## PUERPERIUM AND ITS COMPLICATIONS

Fulton A A Puerperal nd La t ti nal W titis in an Indu tri l Town B I M J 945 Cases of perperal dictat nimetts na indu trial t wn f 43 00 inhab ta ts Sc tla d

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tion and shoutaneous tracuati nion i ci in fian ah ence. The incidence of mast his as described was Bone cent fr the t tal number fdle es t A pe cent of the patients with mast to were d ! eted n the h nital nd 2 4 per cent wr dl red at home The highest incidence of mastitis occurred three or more or els postpartum

Th interest g points bro ght ut in the a til a e as f llows (c) the h ch no lence (th comp) cat on as compared t the figures foth rob men ( ) the hi he in de ce among hospital d ! than mo the medel e ses a d (2) the occurrence t mo tof the cares as late as the corminer eet out

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Her v Figure M D

### MISCELLANEOUS

B H T F Cesarean Secti n in O Li d in 1943 II 1 3 S 8 945 53 39

th ces 1 This st dy perents the e p e c dl i nth f may hoptal fokla d Calf mia d ring the year f 1943 Toh ded ep esenting to per and mety ces ra t ent fth ttal umbr fdl es ere per frmed The in d ares form 14 pe cent pr f the the pult ogppet th ser es nst t t All b t 3 f the nat ts

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f nearly 52 per cent of the women the peg a cysts h first. In most of the multiparas the ind cato for operat n was a pr vious cesare ns cti n II we recidental h mor rhage to ema pre to s d'Ecult labor and disproport accou ted for abo t25 per cent of the 1 d catos s the multiparas

O t tner ns attended 58 per c nt of the pa tents a d general practitio ers attended 42 per cc t.

The operation as elective in 56 per cent 1 the cases

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to pl ce ta prev a or p emature s paration f the placenta. In 3 ca es of ablat o place ta in the f tter gr up th deaths were certally not preven table.

Since 64 5 per cent 1 the pate its had no labor bed ecesare of n it sumposs ble to determ e h wm y may n i thave need d abdom a ldel very lt would seem that e y patient should have a it stof 1 bor unless three definite contrain I cation The indicators for cest ear jet in were var d and m w Pr us section hale I the list of sprop it on d contract d pelvis came next. May yu ual and he zare reaso swere given which the distribution of the section of the sec

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## GENITOURINARY SURGERY

## ADRENAL KIDNEY AND HRETER

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Evenalt m nyye rs of studyb ma wdul r nt m n the structural changes f h dr n ph osis a e poorly understood William W Corr M D

Hinm n F Hydro phros s Th F neti n 1 Changes 5 tery 94 17 836

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Waters Il Scor MD

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WELL II STORT MD

## BLADDER, URETHRA AND PENIS

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a que of ureterocolon c anastomosis is huefly discased. C fley was the first to sugget that a valve like mechan in pre-enting reflux of the feces into the u ters cold be effected by allowing the u-eter the fra ho td tance in the submucosa b fore it

at r d into th 1 men of the intest ne Since delay n operat on f r existrophy of the bladd r is associated with a high mortal ty d to real inf ctio and r sultant renal f ilure oper ti n is advised at an arly age. Higgins rep rted on 19 inf ats 2 of the 1 fants ded nd the rem inder pro

gressed satisf ctoril

The authors present r po ts on 3 patie ts in 2 of the child'r a the first u etces good 5 tom s wer performed at the age of eight and one h if weeks and taw he is respectively. In each case the ur te on istingal anastom 5 s was performed in two stages by the Stek alloy otching e This meth d is to cut the uriter old nucly at this lowest point. A catigut utturen is each through in point and it of the uriter Though a small sutturen is each through the point of the catigut in the color of the catigut in the color of the color of the catigut in the color of the catigut in The uret is then bused in the wall of the it estim for data color of city, then by the rows of Lembert su

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WILLI M W SCOTT M D

lincaln rpyh t st dywasm l f oo menwthfu cto l(ct m l) urcs \ m tea ning camp in the United States The educational and occupation all background of the gro p was i general het waverage Most of the men had lived in rural communities and used out of to teless in child ho d

There was a high incid ce of nuresis in the im diate members of the sold ers if mle s(p e ts sibl gs and child en) A consid able number of me gave a history of discription of the home or of e po sure to various other unfavorable types of motioned mytoment in childhood. There as no d fi ite east e considerable types of motion of the considerable types of motions of the considerable types of motions of the considerable types of motions of the considerable types of the considerable ty

strated in any of the group

There was a relat velyh gh percentage of men in the catego is so below average intell ence (dull ormal h riccit ne and moron). The vat major ty of the ma fested in addition to enuresis varios neurotic tend cies a dip piso ality dis riders usually big in gine any-fuldbood. Bots of theme showed evide co of emoti aliminatority dependince and a piso et type of person lity makeup. Not if countilly the e was persistence o recurrence of some of the various so called neurotic traits and bab id a orders i childhood such as nightin res nail bit is streng fear if the dis stepwalking and talking in slep. Fulctional backache was a common symptom. Vurtually none of the men had ever received a dequate medical attention for the enures is prior to the period of Armyserice.

Functio I enuresis n adults is generally but one manifestatio of a life log pattern of neurotic b havior or pers nality maladjustment and is not

frequently ass crated with adequate i telligence. Apart from the consider it in that the symptom from the strong and freults state in the six cert apper it in the ligerapp type and the six cert apper that the ligerapp type addition to a time second that on tellect at qualification is necessary for the successful performance of diffusion that the six of the six

JOHN A. LO MID

### GENITAL ORGANS

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WILLIAM W SCOTT MID

## MISCELLANEOUS

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E Single Injecti n Treatm nt f G n trhea
with P mallin J 4m M 4 94 \$44

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## SURGERY OF THE BONES, JOINTS, MUSCLES TENDONS

CONDITIONS OF THE BONES JOINTS MUSCLES TENDONS ETC

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th coca repe t g achtype Thm tstikight t brid th blood f pat ts h h t t d f rman le a t nofth s rum ph phatas ligh i litth rum ph phata w bs dnth C2 5 cl s fied r tg graph c lls th phas of the deas rather than the the sel ro tiepha

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ca b mgn g nt-cell I t m w e compleat g factors of th d ase I ech st c the tum d I ped am gpte ts ffer gf m the poly t t f rm of the ds

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ta we enco ntered T ent)-one of these 26 p t ats h d assoc ated o te t s def rmans el where 1 the Leleton Subseq entroe tgenolog cal exami ats nan some in ta ces demonstr ted multiple shad owsof nereas d len ty typ cal of ostert s deformans these pocared in the harply defi ed areas of osteo po o is Fr m th bservat ons in this study it no ld seem that t oporosis circumscripta is an arly oe tgenog aphic ma ifestat on or precursor of steets deform softh skull

f a revie f the lder publicat as on the sub 1 ct at was foun I that the a thors held the view that thesi la Itibi er the most fr quent sites of the d ase Ilo er in the stuly of the series of cas s it was demon t ated th t th most freque t s te of thed a e is th pel s it being i v hed in 243 f the c ses This high incide cool involume tof the nel sm vb nart allvac tedf rby the fr qu cy with which the diagn s was mide i cident lls du a g the cours of an urol gic examinat n

PF a d Shry k I F Bone Lesions f Co g nital Sypi it in Inf nt and Adolescents R po t 146 Cases R d of \$ 945 44 477

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Bone les o s ca d by c g tal syph lis can be accurately dig os d by r tg graphy Biopsy and m croscop c am at on do not offer any advantag

In childe ) g than on 3e r osteocho dr tis is the co dt m t freq ently found Some cases sh a z g zag or sawtooth appearance of th metaphys's with without formation of a I rotic z ne or cup I me instances the destruc t mis so extens that m t physcal fractures d y l on (Parrot s pseud paral s)

Syphilitic per ost ts f nd at a y age alo

assoc at on with other bony cha ges I some cases t has the ppeara c f th I near shadow O cas o ally ma ylayers el pa dhave ano on skin appeara ce ften sharply broke off to im tate a Codm n s tra gl This typ has often been d ag

os das pm rybo tum r In ld r syl hil t c th ldr n osteomy lt is m r

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### MISCELLAREOUS

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with Penucillin J Am M 43 1943 54 4

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I RY \ LO r MD

1 cluded in th article microscop c find gs a I RET GEO M D

Stel leg 11 nd Shullit I J Angi m M scl (A gim m scul ) Rev ort p t mai B Ai 1044 4 152

Si cases of muscle an om a described and llustrated with photographs a d phot micrographs f the histological fi dings T angiomas were i the lowe 1 mb and o the back rangioma was in the f rearm and r in the name of the neck. These tum is generally begin ea ly in life. Three of the

a thors patient ere children

These tumors occur m st freque tly in th muscles of th 1 er l mbs Dav s and Litlowsky coll cted 212 ca es 930 and Jenki s and Delan y collected 256 in 1932 Weaver in h s statistics on 37 cases f und a definite c genital origin in 13 4 per c tand a history of trauma in 21 tp ce t There was a history of trauma n nly 1 of the authors cases Angiomas of muscl are ge erally ben gn hut case

have he reported in which they underwe t mal g nant dege eration P in cours 1 the may rity of cases especially in the lo e 1 mbs and is p bably due to pressure o nerve fl ments ; the eg Deform ty s freque t In 1 of the authors cases

there was irreduc ble equ nus

Generally the d agnosis is m de o p ration but there are sympt ms which indicate the diagnosis Often there ar many tela g ect ses of th skin the a d phiebol the can often be found o palpat on
The pain and d formity are characte it Roent ge xam n tion sho s phiebol ths

The p gn sis in gener lis good Wh th tumor is lim ted t one to muscles tea h removed sug cally with tid grof rec rren If a large pat of a m sel 1 led it h ld h r m sed urge lly eve th ghths l s s me loss of 1 s s me loss of funct hich must h c tdlatr I deffu a gomass g yisaverys m tt randsh uld b consirder flis lithet mith sn lu ct I ff t and the p te t can valk t btter tt prat Serehmorhgifq i these c In 1 th a thrs cas pat s 1 suff t for only pats 1 th g m 11 w r r mo ed w th t m val f th 1 us which was lso grathy flected In 1 cz scle i g tre t me twth q nne sulf t w d b t eco ry was complicated dery much dlay dby s pp ati Srg 3 is to b 1 ferr d to the tre tm nt The a thor h nth d ny eprince with retge rai mth rapy but accord gt th res lts a not good

ACDREY G M M D

Bo tro T A Bi i A III nd Chipm W
A plintl g Tre tm t f Elbow J int
I i ries AR port fit U in 20 Case (m J 5 8 945 68

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hich the mold as left on a lvertently f r

th tee days

In th 12 cases in which the e was little or no d s placement of the fragm ts non plints g w th the tria gular sling was used excl a rely with e cellent results. In addition to these 12 cases 5 cases of Neuwrith's are cited

In the 8 cases r which the fractures wer more comple open reduct on was necessary in temporary splint g in 4 lio e er the pr ciples of arly active and pass e motion were emplyed in all of the cases with res it which the authors c nsider to be super r to those obtained by thoolder method in li case e e tual fu ction of the elboy ioi twas cellent and in all cases at i ngula sl g was u ed Pro at on and supinat on are the functions which ret rn first II on is next a lextens nr turns last

The n nspl ting method in fractures and ep ; hy se li i n s about the elbo jo t w tho t d place ment of fragments has been fou dt be th metho !

of choice

In fractures requiring reducti n oceas nal rlnt g was desired for rather brief peri ds of tim (usu 1 lyu d ro e week)

It is recommended that the nonsplinting meth d of treats g f actu s nd 1 junes about the lbow joint h more wid ly employed a d the results studied llowever the authors caut n against the ind scrimi ate use of the nonspl ting m thod in th complicated cas s requiring r duct

ROBERT P MOVIGORE Y M D

Gray II Arach od ctyl (Spid r Fingers) A & 1 1 11 945 75 5

Arachnod ets1 ie I pm ntal anomal ch ract rzdby l gad lniri nes found in Il f ur extem tes \r oft n ther cong m les ar as ociated ie dislocation of the line I the eye card e d f ets and f eblem dedne I r cales of aracha d ctvly a d cussed and add d to the 200 cases lready I ported in the I t

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andth 3 oth rs are o ly me ton d

it er-old n f Dalmati m thra da P t guese f th r h d sh n no al n rmalities as to pr gna cva db th Then rses hwvr hadn ticed his un su ll l gh nds feet and rs and nam dhm Inl nt H reules At th age of o e h s d ff cults in see g was not ced At the age of fi e he had to have speci I shoes because f the e tr m nar wnes fhift

The examination including anthropological measurem atsamone othe methods showed the box to be of at race and normal ntelligence. Ther was ome eakness of the mu cles of the uppe and lower arms thighs and legs. The hocens and tricens reflexes were absent. Ther was missis and iridodon es a which sers ft n are associated with acrehond ctsls. A systolic murmur was found and tw stra ounds were head over the pex. The n ight was normal for the box s ge He was tom taller than the a rage. The pel is was extrem ly wd and correspond dt a pel us of na erae f m le fr m e ente p and one ball to e ebteen and on half years old The remitalia were normal The shuld rb dth wa narrower than at me was microcephaly Partial meants in was found in the unoe e temites which became m no need distally. The r verse was true I

lowe ext mit es \o explanation was offe ed Key J A Int or or heal Disk Leal or one the No t Common Cau e of Low Back Pain with with ut Sci tea An S e out t

Goorf Press MD

The author states that so-called id p th I w back nan with or without sciate rad to is th most freq e i condition seen in the adult orthope d c clinic Twenty years pre a usly aft r studying a s nes of 300 patients whose pri cipal complant was low h ck pain or scrat ca the author conel ded that the great majority of this patients were suf fr g from strains of th lumbosacral o sacr lisc ioints. The lumbosacral strains ere found to out number the sacroillac strains by m than a to 1 At that time the author tated that alth u bth o tholomeal chan was not known it was su oc ted that th les ons of traumstic and grad I lumbosacral strains were tru sprains with tearn o str tehr e of the 1 aments or joint capsules d that th r ferred pains we e d e to imitation of the nerve roots by syn v to or exudat in the adjacent to nt

The author notes that the reason orth pedi u 1 242 seons had not di cove ed disk protrus is that they had do elittle r o work n the sp canal and did n tann ec t the s guibeance of th fact that the period on a within the canal are q sitely sens ti e as compa ed with the peripheral nerves Realiz tion of this fact immed t ly focuses one s att ntion on a intraspinal cau e wh nd al with referred pain and tis f und that a retate ly slight les in within the canal can cause severe symptoms The p otru o of the disk was satuf ctors explanati n of the symptoms in pat ts with the typical disk syndr me

A les on of an intervertebral disk is Iso a fr ou at cause of l w b ck pa a that becomes localized in the low back or at times is f lt in the buttocks thigh lg r foot Both traumat c and postural t pes of low back pain originate in th I mbos crail area may be f udd n or gradual uset a d be- n with or without known cause. In the tra matic type the pain is pred minantly unilat ral a d also t nds to be referred t the buttock po te r thigh call and even to the toes. In the po tural to the pan as in the midli e and b lateral 1 the lumb sacral re gion and t nds n tt be ref rred

The physical fi d gs th s pat to an d rectly with the se crity i th armt ma present at the time of examinat on All trans t n between the patient with a complait of mild und terall back pain who is complit is negative on phy cally min ation and the nations with a time called k syn! me with sever back and so to my maked med Snasm and nam on m m flmttn fm c m nt of the back a dl e strem tes a ls n ro and r flex changes in the movel di we tr mity may be found. The sympt ms may ry ce the from time t time which makes too sill t tae th various fransitio starres bet en th mild under teral low back pain and the type id ks drome a single patient if he is studied ove a pe od of time and his symptoms become aggra ated or a bade during the period of observation In all of these to it matte types of lumbosacral stra s a disk les n i the most formal e pla att n of the tham tie r l f bear ed at times by man pulat on I the low back

O phys cal examination I pat nis with the pos tural type of I mbosacraistra this hitt der e s on p essure in th 1 mbosacrair go and th nisa ra ated by hyperest nin ithel which In m tin tances the nat ents d well u der co s r treatm nt. In an occasio. In the f with a I mbosacral stan f th po tural type pe at e

t mm nt is ad sabl a d n about 25 nstane the a thor 2 moved d 43 which protrud d 1 the multi e and n mo t of these the perat n was [ ] lo dbs rel fof the pain The uth bele sth t pra teally lipat nt

withid n the low b kno the saue sa thath nunal canala de og per e nt of the e s s th s is a les n of the tern it bral disk I m ld ca the ball or babt eg at s th dik tell it possible that some of the back pan is fult rrit ton Ith nerve oot and srirr dal g the nos tn prm md aith n l d p nal

Then bim fdiagn sait ditem n or of th pa off ates in th I w bak lip the I w back is the d m a t sympt m the D rach casdbent meany o pelie dis a th main n the lumbosacr lr g nd th a au te de nd epp es, re a d fthep is gra ated by rtam mutsofth lwbck trm tes ton nates n th low bak It mas b da to a destructi disease of the bo wh he be diamos d'roe ig log cally These es mpns les the percat fth t tal mbe frass f low bakp in It is the op ith a the that th the goperent th les nis trasp ln ging, dds to a les Ith i tervert braldisk I bout ope if the pate is perat the tre tunnt f cho e I the majenty the p eth t bs es sponts eously o ; lds t to sers ts e treatment ad in th rema d r th pa disability a e ot ufficient t warrant perat n

The fact that some patients co to ue to have poin after the operat n can b e plained by (1) incom pl te rem val of th ffending d sk (2) rem al f the wrong disk or of only one disk when two or mo e are causing symptoms (3) r currence or p trus on of more lisk mater al from th ffend ng disk (4) later protrusion of a neighboring disk (5) the pres e ce of a ridge of bone at the margin of the fini g d sk (6) adhesions follo g the operation (7) arach old tis o erve damage f om pr saure by the d k a d (8) at m r may have been m s d Mans of these unrel eyed cases h ld be operated up a d time and a hemilam n tomy should be ne fo med, I n cessary and the low r lumbar can l shold be pl dth rughly Thea tho has aban doed spin lfu io as a c efridiopathic l back pain after unsuccessful disk perat as The r l f ometimes obtained by the so c lle I d c mp essi n op rations may b duet thec fill brat nerve roots rather than t decompres 1

# SURGERY OF THE BONES JOINTS MUSCLES TENDONS ETC

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1 t cal proc dure in all cases

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# FRACTURES AND DISLOCATIONS Hinch y J J and Bick ! W II Fracture 1 th

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g rous but by n me ns cessar ly fat? Cf teals ns reacter cases f isolated fract r of the atlas O dn rily they co sit np mands if mess of th neck with the deriverse, sept all v n th suboccipital r a. Ut one are usually limited and slowly per frend although the erray be nation if which causes the past ent to b ld b. F ad with b. at Go Occasionally, the patient my complain of taple gand paint the res indiers deep the above the country of the control of the control of the country of th

or na particularly I cases of fract e I the an trot arch In I ement it hig rater cupt if netwe may i oduce ne ralor ver its area of dist i but on Inj ry t a y riebral artery occurs in rainsta ces

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btained with most of the m ans used Fom at 6 pou ds ( 8 to 7 kgm) of he d tract on b d n stra ght ext us on r sually s files ut for tum date rel f f the symptoms although occasionally mo e reneeded A Say e sling will a fice f r this R lazation of the neck mu cles q tckly obtat ed and n a few days a plaste east or le ther coll r may be applied t tmm bl e the neck Shouli the fractur be complicated by tendency t sublux te the tract n m v ha e to be cont n ed f r three four week befor the us fa coll r From si to e ht weeks after noomplicated int ry th pat nt is re-examined and n w roe tge ownams are taken The coll t is disca ded at my time fter fr in eight weks to lour m oths a cordin to the progres f the pat ent nd the roentg ograph c find - Aft r removal of the collar return of fu to is materially aided by physical therap Stiffness d limited mot on of the n ck re stubborn res dua of uch t t ries. Alth ugh it m ) quire some months ulti m te ret in f fu ct n is lmost l ys compl t When the cond t a is compleated by greate con pital eural a how f persistent pai mas r q sure cal int ment Lack of call s f mat on it characterist dlyed incomplite io cent ring egul rly and non mon occurs freq ntly

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Inte we the the cadal smpt mades abd by Ken y namely muscle pa m tial at n and c ordinat the auth raref r to th and ga of Mila e Sch arts a d B ma a d W th Braz r and Schwab \ r mu ula de e r ! wspesent nall thucles dilntl Mu I spa mas a comple ph m n produ db) theet et es (a) m R al imitat () han d ste t bred es of mu cl's oppos de m s les bbit neur m ula deg rat a d (t) s ritati les s I post n g lions and pe ten rh me lls ested spasm il mu cles lets curre to cept the complet is pails if Cliff m Incr ased action pot tial wrf inth rest Il mus les | 1 h th ra jam f nt especially it the m thre is prod Thes re is bel dith tiths as dinc i cop en of 1 roat 2 Thes est gat is bo n ted smulta cou ti curnt t both fite pat is ec t m poloppo m seles mit whihp bly a utdf th ncoords t n

ords the thos part cases of uterlambelts attempting test must the teacy frottem htfm tat a domes!reducation All are bleed pain the firm for per

All aes bited pam thirm i a per umtable tribir f pri imtedim m t The mustles most freq ently in elved we the postror c ryical back and hamstring. While these are them sele gro ps; which uritability to stretch stimulation is commo by attributed to min geat irritation such is not the case in polomyelity is cothese symptoms of it apers it many month after all possibility in mening all irritat. has piled and also becalt the spin 1 ft ind was folid normal in a is gin ficant number of case.

M scl we kness was observ d in 48 cas s Weak muscles often devel p d atrophy while und r t at me t. M for power ge erally ret med gradually

during re-education

Inco-o d at wasobserved fr quently pat nts
with weak q adr c ps who on b i g asked to t d
th k ee would vi bly co tr ct th hamstrings

Of 28 early case in which one hir tests er do eafter the injection of stigmine 4 (83) is city that the light of the stigmine 4 (83) is city that the light of the stigmine 4 (83) is city that the light of the stigmine 4 (83) is city that the light of the stigmine 4 (83) is city that the light of the light of the stigmine 4 (83) is city that the light of t

estimated by electal entains ton.

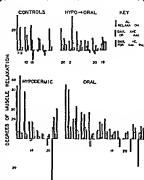
The authest could that the very least of continued medication it in most game or or ally resteutant country requestions and the results of the results

Thea there tat the the ken a tree times at the orwithoutner tigms in flect emethod for enting so tact did finity

The study ga p f that e ther neo t gm e r kenny packs r due th 1 c dence of p raly
D with H L vi. H M D

For M J a d Spanku W H Neo tigmin in P N my litts J Am M tr 945 8 7

This t dy was he don the treatment fizacases of acute a teleor polomyeliti in pite to fifth five y aris ld. Aeo tigmin wigners subcuta o li ani raily Actile pices.



Chat Effect f cost on m sel pam rel t report d f ght d lift ham ltings gl te l m les f c ch p t t

dd not rec i e eo tym All f the cases w re green kenny h t f m tat n t eatments. The re sults appar thy d d n t le d to d finite conel is one but the auth rs th ght that the comb e l u e of nec thymnics d h f f m t ton result d p rs s te t nd percept bl is at n f the musclesp sm. Da Il Leviymin. M D

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

#### BLOOD VESSETS

Sell rs T H 5 rg ry f P rs t nt Ductu Ar f rlos L I Lo d o4 45 6 5

The author states that the first cres files ex which a natent ductu tten sus wa o child d by su Lery as ecord di oto Anumber of s cors ful case has cheer recorded non-that time. S. e. gers can build by thos cales first not a hehth ocel s o ld not br gabout any d ta m toth reultry tm It can be fore t b efit t pate ts h a s ff ring from Heffe te att batabl to the abnormal t and it mu t be de ld hat c roum tances a d complete st tut nide to for terfe e c

A pers t nt ductu n art toxe o 6 tula thrugh heh the plmo ary and system ce teul blood stream the uch the ductus from the high ne r fth rtaint the loet in fthe pulm nary c culate n with the res it that u h suit a dedde a occurrat the ma tourn to blace o the pimo are id fth ft la E ten e dilat to of the pulm nary c nus d et o and the man pulmonary trupks with the while of th a so la bed f th lu os bec me enla g d If thre seclates dishly tailed pend th p port nofth system c blood that i hunted the out the ductual factor in the form of sub acute bact n fend ca dti th strept c c u i d s a th ca sat y rga sm acc u ts fo bi h n ree ta e of deaths. Abbott e es the figu es as s spere ntofth une mpl cated ca esin h hth rate ts ha art d th first fier rs of hi Subscrite indoes dit hich occurs in the pies e e of a pate t ductu defi t ind cati n ! e il sure p d thi is vin more mphatic f there is ny fal e of espone to chemotheraps fecti n n h ch get tio s m ta d h e tended bey nd the pulm are r the
cha ces of cu a educed but l gatur accom
n d by ch m th app may l ad to ultim te ster l zat n n aft th nterval of yea E I perat on n all ca es f nf et s f lly ju t fied In care of pers 1 pt d ctu th a ra pecta t flie sbet t ntva diw nts fi e se re T ch ca dia and ex g ated pulsat n which r he r uht bake the whol bods dto whih dem nd the con drat of ng D Ther four na amptomles case are largely p ophyl etr el sur f th d etus fa s t known will pr nt the courrence of he rt f l ure nd inte ti n Against this m st be b I nord

th nk foperato The reason for co timed pt cy f the duct arter osus is a matt r for conjecture. The ntra thoracic n gat e p es ure occurre g with th first breath of life udd ch ges ort a di

mannesus adt mnovil righth sy t mic t n n whe th placental circulat bee x hul i h ve been ad need a no hi so of rth clos re The nat me l relat so sire to close the and metrelate the ductus with the aorte recht a fact reach hulf be con dered lith ductus placed that the angle i med between it a lithe ricach act th firsh of bland the uph the a rist not t a we past the d ctus one i e If the ductus les l acutely the rush of blood may imp e a them th of th ductus a d maint its pen ng

Th surgical tech inue of cl u is 1 th 1 d t ! Te case reports a e p es ted Occaso alls nap al sti mumur pers ts

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ascular fit la ar 1mm diat l' reil ced but mas t d sannea e mol t la f se eral m the Th r hae benroodd nst ces f urnce fth two cat o t at d et s m rmu 1 th ill Th s ha usually r s It d I om the I gatu es cutt g th gh the establishme tol th fi tul tho gh fall sci chani The chee firt mtri adm thod of leat hant be fl settled I infected ases pers tince if r sug estin f mbol m a nl tinfrafull cours of chem therapy t dal th eg tat shehha ansen stes thrth e a th du tu I e cld the tho testhat pat t with an une mole ted n te 1 du tus a ten s r th isk of abacut batrl d fti anih t fal Lgatur ith halned tk ly for in case behind a f d ton irlatu

r n ble p ocedu e

comm en hattal e • F T 17c

P nd rgrass R C. Cardl c Ch g in A r rl n s H rul im J R it 945 53 4 3 Th a th states that f the most f a t ad no scula i nes i mod m ria art ri us fist i Th eff ct i a a i r n s fistula upo the culat g ral upo th he t particul ra so mp t nt th t the tt t fr nt l msts h libe liedt th cardiac cha ges d t t this les these ha cs s lly e ers bl by lm at f th fistula t mporta t that th ca be etognized Th heart hanges f beriberi mys d ma and hyperthyr dism ar t m at tr es ble C nstri ti perica d'tis 1 i t'nt d tus rt n u ff brillia t examples f th

ber f ! flect f urg rv th mp m nt

flug alimit /

fistul is qu'lly dramatic. Any patient exhibiting card ac e largement without obvious cause and who has received b title inj res should be ca fully exam ed for n'arterioveno s'fistula. Th's includes auscultat on of ll'w u ls.

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locty fthebloodf po milt the fitula. Thith the cases of artenue ous fit la ha e be stded r tge graphically with spect to carlae m met be fire a dafter suggeal it toon fthe fit! The t is are it d d the inverted to fit the detection fead of enligement (a) the effect it impray mul objeteation fitte fistula (a) std. I the

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taken at 72 ches f ll in p rati a d 1/10 cc d

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g e ns i rail f li th blood pres u

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A d rion F M d P tt ri n R It Phi bog raph d Treatment f V n Th mbc i North re t M 1945 44 178

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f lass ephlermas albad lens

The thrombus us alls in nates in the senous nle uses of the call I the leg It ma reman cal ed or take an of the following on thes (1) n onagate up the f moral a r in to the lack in th na ra a se loos le attached s ft th mbus s I h to break off t some point and r s it in pulmo ary embol m of a ryeng c tents (2) t mas propagat n su b m no r as to fill the e mor compl tely and become adhere t t its rall with ext not n nto inhutary a ins a d raction i the walls of the years and the perind ampt ms both I call and generall in othe w rds th mbophl bt It may go o farther a d complete fema a line extern a with blo kine n and a ma ked increase in the inflam ecompa me t agan the penue of mators phleomas a alba d 1 ns

Sold re t tirning form erseas un to h had ufficent d comf rt n th theh e call to in canacit t th m for a n ral m tears duts sho ed radily vident vehou h touct n ire oul rits and tortuo to f the ens in the phileborrem In the cares the authors to d the usu I clin cal test f patency f th de p e to The phl bography

be uncertan o unr liable

t chn que a described in detail Ad ant es of the phlebographs t ha qu are Ve re need rately be cut d wn upon a d th procedure can theref re be eadily repeat d 2 Two p ctures of n dy all of the e tr m ty a e

obtained The somet mes confusing sup rucial us a c usually not shown. If ne w shes t unclud them

the uperfi ial ems the tourning et may be r m ed afte the first b cture

a If present a competen ies in comm n cat ns will f equ ntly b demon trated

The tchmiq is a mple e not rquing pecial q pm nt and q ckl counted b ran dly cha ging ro ntg n p rso nel

Tnesse port a eg en ind ta i

Heparin p clones cl thing b red cing th hes eness of the blood plat I ts D cum rot n prop d sag h ld down th blood pr thromb le el by nhib ting to formati n in the h e with otdly g coagulat n a d impars dt trac t n Larg r docages prol coagulat on with eno s darg r f hem rrhag Th authors do n t recommend the 1 di crimi ate empli vm nt of I re d es n th pev nti r r tratri nt of enous thrombo : lo th I II wing reaso s (t) when thrombotis has already occurred their dmini tratio does not gi e a rap d o as imost comp ete rel el from pain as does I "ats n a d sec

ti n (2) it is not coperally accepted that they are el de the possiblite of en fatal n imo ary m bolism from an already formed thromb s (1) th mas be causat e factors in seri u or sen fatal postoperat hem trhan (a) ( other propoacation of thromb may tes it aft t discu ance of these medicat as (c) the diraced senous channels are I ft n count is to and may t It fat r in recurr at thromboohleb t especially if the national is later bedridden by overston or

oth rullness Th Su sical Staff of the Lett sman C n cal Hosp tal San Franc co Cal forms belie e th t m I cate a a d section is certa 1 th procedure of ch c n the cas of a v pate t with se o thrombosis wh has had a pulm n ry mbol m i a s decree wh has an cut ecure c or ft ne un fehro ic s n u thrombos who is e fift whether r not there h s b e a p lm nam mbe hem or who da i os the mbo si il ng en

cedu c of a mult ple stage operat n In concl on the uthors tate that pile boeraphy g es inform t that may be u [ ] : determining the type of the the treases cho c r recu ent s n us thrombos a th th r

ariou complicate i el ding arico e in chron e o sinsufficiency and no tribible r rancose ule is Ob truct n of the leen e o tru Ls may pers st f ma y v ars I som thes cases in hich old ry tests f hat nev ar unc tan phi bograph; pro des d h it fo mat a r ga d ng th e us c reulat n l hi ho raphy is or el rifies occas n i important

c nee it lan males fth e

II h en sleat on a dect on thet atm t cho ce f r n ariy all ca es of cut remnt Phi bograph is u en us th mbos as a pr I minary t I g ti n n chea es wh n ther ar d f te I cal cln cal find as In pulm 19 mbol m with ut clinical evid nee I vin thrombos at may be u ed ad a tageou I t t rmine the origi I the mbol In cases of hat raf th ombo s en ligate n of the appare thy u in ol ed e trem ty lso should always be g n rareful eo 5 derati u

The milder thooj ct ve s gn of a a th m bo s th grate is th chanc I embolism \liso th mo e rece th th thromb has formed th great r is the cha ce that a co d abl po t heak loose d be carried t th 1 gs facts h w th hazard I wat g t see wh t il happen in ca of mild r d ubti I thr mbo s HIX EXT F THUR TO M D

Aff n A. W. Lint n R R. d Do aldso G A

Thr mbosi nd Pulmon ry Emboli m J Am M A s 945 3 397

Altho shith authors ecognize th comparat pulm nary emboli m in safety as r gard mas true thrombophieb tis they beles that I t cog nized ath first few d ys of the process th f this dicas can be altered by rad call t catm !

They do not belte a that i terrupt of the fem ral has any place a thet a strengt I truth mbo pla but after the s the day. I the I sease und s if at the a ce tr at The e fler the d g s of pliebothro b si r th mbophib t s with summer late b I teal t rupth a flue fem also the shorter the p od of d ablity. If operat s de pied ut I reped all right ease curred to the strength of the st

on the state of th

Except in rare 1 st c bilateral int rupti n ol th femoral a n is 1 d cated all s eb pat is becuet a umb r of ca es thi mbu f matio ha been fu li the pp tly rm l fleet d temity

It rupts n f th fem al h s b d pt ph f ct c lis with that m a few ld ly pa te ts with int to ch t ic fract t so t b h pa l in a me q g m j abl m l g r l r cancer

I very attempt h ld be made to m k th d ag of the both bt bire th fm ral a d ile is ha e b-com in lel by arh red ced tetm t th post p rati q la them ha In cae ith fem ! oth mbo ical emo al 1th th mb 1 m th trat d t b l p sly s per bl l f g l IIs d ່ເປັ h she din trat dit b Ite th It sh lib d th mbo h be d es th I will g th I gandh to the covers alp seit a. ftlplm mbol m rpotd 1 thsh I th g p f 464 occu eda th lt ff rl m t 1.1 The auth rs co l i th t th m heaty thromboembol c d tm dul ed ils

perat Thathesfudthtpt t pt t d will while here you was edit but ha a cure ce fth mpt malg ft th har we stopel for the truly it the trul to be Thath h I thi curred ft fm ral pe t 1 m Th t rrunt tsc t so t ly ft art 1 grs De m I has bee ed t usly m 11 ubetees Them thou it to ton;

become sufficiently stendard zed to warractits more the sie use. At the time however, it is tassafe rasi occuous as fimed in interruption

JOSEPH K. N. R. T. M. D.

#### BLOOD TRANSFUSION

Van Duyn J II Deg nerati e Whit Blood Cell Pictu As An Indicati n of To mla from Burns A k Su t 945 5 4

The question r garding the presence of a specific tox main burn is not y to titled and the eratlast six distinct attitudes to be found in the later tree.

1 The is n true burn to em

2 Inf ct: can account for the whole picture of hu n t xcmiz 3 II moconcentrati n (second ry sbock) can

3 Il moconcentrati n (second ry shock) can
acc unt for th whole pictur ol burn toxema
4 Burn t maca the pla ed sol ly on
the bass of pl mal ss and h m concentration

5 Burn f xemia is a result of hepafic damage ca ed by a in 1 furn a result 1 hem co cen tr f on and an impaired c regist n

6 Thr is a fru b rn fo in bsorbed from the

suiface of the burn and responsible I burn I emia. The persol of toxem is h being e railly accepted as com g after secondary abock and before the on st 1 i f ct i. W I son has I the phases of burns m accurat by as I il was (1) p im 75 shock up to the hours (2) a condary she fit from the of the third is the hour (2) a condary she from the of the third is a distributed by the contract after one do not be not provided by the contract after one do dred by the toxet ma after one do dred by the toxet ma after one by the contract after one by the contract after one between the contract of t

S condary she ck and acute to emia are difficult in a size chincistly because condary shock with the test do not carries or into the tour pha a do both my b a discreted by the pres noce of a pass r the complexet In add to while seed dry shock is lairly c stant and predictable a d can be estimated by the hemater t forem a screate ad c retain a dit e is yet no labora typ pocedure t predict ts devel in t. There fore the auth r und rook the study. I the white blooked is pet ring a me burned by h t I will be a set of the size of the laborate the file long conclus s it m his i est

gat s Thr is a hib t ry flect n the leuc po et c vst m frequently demo strabl n burn which is it t fr m th dn ry stim latory effect pro i ced by tra m ti i i lected r n er tie t sue This inhibit re ffect is charact ried by de g rativ cha es a th white blood cells which can high difficient ated from the reginerative h nges res lti g fr m ord nary st mulat on Wh ex ther p n rati e blood p ctu e is due t in fi mmat ry st mult the digrerate blood tu sa esult of txc i h bt There i th r f true t m 1 brr it ct from tr m # i h moco centrat n th I seps n th th and d e t th absorpt on is m t ics bits cei mitheb mar

Fr m th first t least th third or f with d g a h m the white bloods II to cture mu t be clos is watched if the et of t em is t be n ed cted In the cales of erest to must be de ge erat e cha ges come a randl and a e treme B heers of the degree of day rate ch nees in th whit cill the nest ce of t x min can b recornized ad t e ty est mated Th is m re difficult when the net gnerat e reg rat o e h bit a d timulati na both eti et ther lit mais not e t eme b t st li ever the progno may d p do wh ther r not generat cha es char es re leven rat e and f ma ked des ta dicates that some complicat gunf et n has d'el ned such this rn cum In s b cases the n

os s 1 tll poor b t it is prob bly just uch stances th t the best hope less of f rtber l w n

The dege crate white blood-cell peture f d in may cond t s besides b rns - f e male test all obstruction - which sh we that

theinh b t g tox i t specific

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Dun gtheto cphaseofb m theprem smay dpndon the dgee of dracy of th what blood-cell petue. If the pet e i mused d gnerat regnerative the progn i rectha is as miarde recofd gn rate echag is pese t

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tran fus ons dun the t mephas beau of ts knon benefic I effect n the d cate hite blood cell picture. It may be that I tract ets through its benefic sI effect n h pat function in general and its deto 19 g ab 1 ty p teul. Doses of roce given i train scul I ding h the thigh h is fift to phase

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Tosers K Nar 1 MD

B nfi R F Tanturi C. A and B y R Pr thrombin in Preserved Blood J Lab Cl H

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## SURGICAL TECHNIQUE

#### WAR SHECKEY

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SANUEL KARN M D
Capper W M Treatm at f Battl W and Tw

St g Operati n Lone l Lo d 94 48 587

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months end g Sept mbe 944 4h tit ca l
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pley tth fpc l D pt tes erhtt mybe d th l tag pr lly htt kw d h htt m te acc fappost of th dept es difficult rtmm tit maybe ll w d th be tiff stac th mad th whereth il d m ll or pod t l t O th th w d o th cap l

gr at trochanter and the subcutaneo s t b al s r f ce tens on will certainly result in wound bre k do n Bu d sutu es are for the m st part unneces sary and it s better t avoid them

ma ) of the w und D d space su avoid bl If it is deeply sit at d the best e rie s to i troduce a pen c ll tube with d pendent drain g By the se nth d y when the t b is emo ed most of th spare will ha bee obliterat d by th fast gr ing hem thagic gra lat n to su th t forms a the prese e i pe icillin The h le for the drain g t be can then be utured if n ce sarv Superficial de d space is a m e liffcult p obl m T tage f the pare with a p thel al brilge i lm t rta to fa f It is best eith t r tate a skin flap to f ll i t th underlying hollo o t sutu e the skine iges to

the shelig walls of the gpade e the interng space with a split kingraft limp tat t pay cls att t t gener lp ancipl blty wh a flap is use If r thi p rp

gatt bity was anapisuse if rim prop Ufth gal rmarg alst, of a wound the betpe blee bth these the bl the benth imt pply k graftt the le and ir atthist gwhith f hm is rface g es a gre t r l k lihood of tak

Th impo tance of firm f

u b dag absolt fx tion of the rt in the pl t a d of ele at on cannot be exaggerated. Plat b k lab w th a ldition I si le slabs as found nece s 3 1 ed wth wt pen ve bniges haep d m th n circular plaste f (as s f) th tı fact

ou Iw to b in pected five days lat Co t a de tions to suture ar surp i gly [ The m st mmon re establ he linfecti

plt w d en nd 1 ol ment f blood vessel or 1

Orssperc t fth woul h p th lak cyrnth furt thdy ftrsut achal 1 firm addy Whire It Th cars f the les no thed prt s esmayt k k rm nth less fits fluilandifct a pr ted and the improde it in ith pat is manifest

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pple and les ih nt tha th that f ll w gra lat on 1 comp r so f 58 th gh w nds sel et 1 t rand m from con al cent-depot co ds h w that th a rage tim a ay from duty was h dre la d fur dysfrunsut red wu ds a d ghty-e ght da f sut red on s Tb too m ll fgure t be conv cing b t t te rth th to per ce t f the me with sutured w u ds returned to duty in cat g ry \ 1 comp d ith 54 per e at I th acw is rec to tred

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OIL REE BAR St D Itendry R W Gledhill W C. and Pric B II Treatment of Battl Ca ualtles Two Stage Operation Loci Lo d 1945 48 6 8
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Bhatla D D 1 y d and Secondary Suture of War

W unds Lanc ! Lo d 945 48 6 3

These fi e communications are all based upon casuafties at am g back from th Gothic L ne in Italy dur g the later summer and early fall of 1014 By th t me the methods of treat g battl o nd in It ly had become fairly will stind relized con sisting roughly of immed to first-stage operati e treatment in hich the sound was tammed dead t sues a d f re en matter w re removed (metal c bodies n t c ns der d d ge ously noeuous u les etal d between the nd of fractured bone ) an la dressing of sulfathi ole penicill n po der or pos dered sulfanilamide alone or ther available s if preparation a d fi ally dry paraff g plac d ver the open wo d Almost all of the fa tie ts had rece ved a titetan e seruma la short o al e rie f s lf 1 mide many had been g n ga ga gre e rum transfusio s f blood or plasm In s m fractures of the f mur a Thomas splint was appled in others some r t tive dress g a d th pat ent w s sent back by m n of air or sh p evacu t on t the base h sp tal In these e acu tio s th pe ity of a revar at n is grated but Ife dry

as good esults the right shot that penicle can vercom my slight delay in e acuatio. Later these sam authors c cl de that wounds n which pen cill sulf thiaz I powder has been used at th pr mary perati nat th fr nt h s d ff r but l ttle as regards r ults fr m th e in hich s lfonam de powder at h s bee used Thus find g ha an important bea 1 g on su g ry in trop cal cou tries who re peniciff n c ld n t be stored in the f ri arl a a at the correct t mperat re

S day more 1 ss after th w u l g nat tempt smad tos t ethe oud this be gdesg n ted by s m of th se uthors a th s co d stage f th operat treatment and by there 5 the dlydpimary utur of war wound The co tradeatin to the sutue a (r) i uff lv nt kin a d ( ) i t ratit al cell litts r gas g ng m It pl wou is a d d ep open wounds in

commu cats with fractures are sutu 1 c mplet is if pos ble at I st parti lly pe hap with u I rmini g f th subcutanco s t u At th s operat nithe woulds again revised a li cised fit s m necessary (bact rial fi d gs are fin great ampota ce el cal adgm twll suffc ) b ta open fra t res no attempt is made to cl 2

h matoma t the leact re it th to comm ted bone fragments and n co id rabl fi et se m d to locate m tal Iragm to In te d in add t in to the tand rd procedu es for the hall w soft t wound in these least ecases a table and mad down to the fract t a d a mall rubbe tube or tubes acc rdn to th 12 a den e fith wo nd 1 led do n to the iract e a nd a sol ti of sod um pen cill sol t on fact facel tim contai n 500 Orford u to pe cub c cent m te) on a post Othord it is per cubic cent in tells to ted trice dal to the tuber riches for fire E choate talso tre d 300 000 ts of sod m pe icill n b i tram cular jet n th rse e mmenei th da f peratus th u I f Athn t / it rec td d th ta feu n to ats e nec all th senithera mult plean ad r cen addit on a hort e urse labo t roe oon u ts) of sod um pe cllin pro ed re wh h th s n w h w er con de t be unn essar.

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r utur f the wound i m e r less s follo
I th operatur room u de cent th i nesth

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th st i he re emo ed Wh I part Is tu e ha bee accompl hed at the pour perato it s ornet mes po bl at this d'es period t e mil to the tur perf rm a skin graft A fresh pl t is ow applied a fract re cases and the pos f the Iraom nts che I dby roentg raphy

of c tithe suth ciwh f I sessmanta d d posl thept t mad With poarently w mportant did I man in sith mithod free th battl w widd which has been row thy utin d th authors of th se so fiar it set retidate that I doay rwo d threshits with hat best are sto d g a d at worst ompart in the man and in the man and in the most ompart in the mithous man and in the man and in the most of the man and in the man and in the man and in the most of the man and in the man and in the man and in the man and in the most of the man and in the man a

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t n d
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the first th r w re 35 p mars d c

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n I pon n tit t n i the c d n perat that ut reo n tt mpt t ut re imm then the do to he filt d) if the pum n w d s n had be n do thes ut n swere abl to get what the des m t a a sue full esult—a hald

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bit reads 3 m at invaring but the the day (of cors in the fith) uses in the bib be asserted to ff te in 1 the cut m ted ond to estate the military to the fith dree tat 0 0 d a held by the two the day of cac as 1 self

saf lure Therma gap tet hadt u de amputato Hereava od ath rm to d Theases ported by 4thin t l stoffs with the few had to de the house of the stoffs and the stoffs with the stoffs and the stoffs and the stoffs are the stoffs and the stoffs are the stoffs and the stoffs are the stoffs and the stoffs are the stoffs and the stoffs are the

Thus in the entire m terial there were 6 S suc cessful results 143 partially successful results and 46 failures Th re was only death and this occurred yeral we ke lter the wo nd had healed and as

related to it

are m or

The m te sal of McEwen 1 of const t a cated 1 the captio e lus vely of pen fractur s of th femur At the rth pedece ter Italy wh re these surge s work d the tr atme t methods ere much th ame as thos deser bed in the other atticles nd the esults were reg r led as a ece slul if the w und was en ert d lr ma ope taclo du ithin a reasonable le gth f tim is e ment f the re son ble l gth of t m ho d n nde f rather pon the ze and s to ol the rigi al w Is a I th po blits ol cloing thim by sut r f r

st ee in tinthad cleanin ar ound & hes I ngth at the m dthigh which was sutu dw th ut I fi culty at heal d in ght en day A th r n th oth hand had t o elin cally dirty o nf o e f hich me ured g by 4 in h s the

ed truct nol th buttock m cle a f e mm ut on f th gr t trochant and th fem ral n ck It wa not po ible to elo the larg wu l comilt ly and the case as rg ded a em tip ceessi l when the kin was hald complit is n

ty-one d ys ithout any ant ced t p Julg d by these standards th ef attained 1 47 (So | reent) f the 50 ca in which dlay I prm ry (s c d to ghth d v) r nd art ( fter th t th day ) autu nas per m d th a rag tm fhe lngb i gth rtyfu dy Th Th t n lays fre ing the w un f) this 10 g a yea f anx ty ch c pt tt r l el pel l no mputat no de th w ree ried The rm n g s pat ts th pe fem ral fractur c uld not be a tur l b u f th ze f the wlorth presceofg solet n anl 2 of the earth is ar gadd c c sesand 3 a falres lire n m d tl

Bh t matricustd fas o d wth 177 d laved prim ry sut (ith tad s lpi maryee n) wthe mult heat (cope nt) n 166 (96 6 per cent) 3 p t nt th he l gwa bet no anlog pere t the 5 t a bet en soan 189 percet nd n ly p t nt w there is that greenth I gat the 1 th rema g 227 nds th utu gwass ni y (firt nd s) ith complet h aling ( oope cent) niss (spece t) nithhig bet ng dooper tin situation by perce taln fit asblw so perce tl th es feases th res It f utu wre s sat ta tory the nd soc t in the mpou difractures the fimple fisher i

inth t sites farted hiere wed pratt lly n att to was all tid to the ultimat result a I from al 1 fm nt fre d alpal es ndat whgure thempt gt show th the tir t with penicilin had no adverse effect on the format in of calling in the nationts with fractures

TORY W BRENT

Stammers F A R Th Policy of Delayed Sutur R le f the Forwa d Surgeon La / Lo d. 045 45 556

Delay of s ture a practic d d ring the latt r h if of the lat w r lt bas come to u e gain du ng the past e ght en m nths a lin Italv e n l t as ha e been favorable t its emplyment f ge scal Results a extrem ly gratily g l r with the ad ent f penicill a much higher or per t on of suce es is obtained than in 1917 The cond t as neces ary frag erlpole

d lay d's ture t b successful are Adeq ate f ro ard urgery appropriat t th

t rain 2 Sh rt li e of evac ation 1th ba e host it l wth afwh rs d stance of th ad a e ! rg cal ce ters (Cases mu t reach the h ; t lat which the s ture is t be perforned of f ter th n th th d or f urth d s aft r th primary perat n)

I gro pol urg as at the ba ef liv ali t the po ibilt s f del y is ture an i orga

n zed coord gly

The following rules are ow I llowed by all I r a d su geons It b First has a if mag f skin a unlith no fad ahit thoopal at Th

arpfs sem such antisepte s f i ein p t Rm ve ly th julped of ed e lg ıod the skin th Li ound mut be stand in e so sing ught all vrtaetors t be in t to the full depth f the w I o that it can be full in pecte | Lice ny dirty fat rfaser deut ff any tag ffa e Rm call m eles that d ot bl dord n t contract hen eut (mperf etr m sal id vit fiz dm clearnes ther k fga g g n ndina veasef it seps sandh nei to aw ni nit f ea fy suit n) R m e peces olbo that h ope osteal attachm t Rem vea v and a n cloth ng qu pm i lrt a dany frag m ut fm tal that i really coes bl La pen ali ook I rannes which pock to I pu may Wale gr rous incit sit the di fasci tra sers ly swell | gt i ally so prophylactic decompres ve me re \t tl th peration good frost f pen cilli m fe po d apriled a d lun g per t rgeon pours t th w d r/ coo c t in

It fire an nt pt 1 wh h m v gain 1 tf bl f ith in peacet m tra mate rg ry dres gol ulf lami le paraff gaux s prl 1 b t pael g and ro st tch s are perm tt d O needn the frad im k gal gie nite beel elatth be din leeditise sertos tu tha a e cul i h l Ad q t incison prit cu lasts imports t when th ret ad | a let n ive mu I w dly gbeneath a small w n1 f try When a through ad th ou h wou di perfecal t

s best to 1 in the two together but when it trans fixes d cols - through the quadricers or deen to va cular bu dle-each wound should be treated s narately as described F may m sel we a deof the butto k thigh calf a ll rs f ld a three-day course of penicillin is at n eith trampseula la by glucose sal e dny The d IS Report to ers three ha re

There is no d bt that ne cilin has contained d t the reduction of the me tal ty from gas gangten although flicient forw rd's reers a ll always be th first loc of di se A es at al nart i treatment a ad quate splnt g Q te ap t form fractures y wound involve muscle sb uld be plat d
the bet f rm being plaster back sl b o a lebt cast it should nelude the ; t below to oth ru th tatient tra Is n pain not the won duen led by the recoul in vements f the amb l ce Experi ce shows the t Crame we s too spigs to sie comfort during travel e rough to ds F alls aft perat n the would she ld not be

in pected n t l the p t nt has reach d the theat of th hosp tal at which a ture is to b p rformed In the ab nee of pan and to ma any sposure of the wound at stag ng no to is meddlesome a d wilf certa niv le d to superimposed infection The technique is applicable to all will dewheth fith limb (with r with ut fract re) th

chestwall the b ck r the smill. The fl ps fampu t ton st mps ar l ft ope en two gu din stitches ar likely t result n the accumulation of

lot which I turn I a sou of ps s If th re b a ; who would er t care th gen ral m navem tof w und in forwa dareas t must be r m mhered th t the traumatiz ne effect f the s b seq tambulance journey fro gh ads dome nat a the tates f adva ced su escal ce t d to a la g ext td ctate what f tward su geons may or may tdo Af dam at lfact ath policy i del ved utur that th suture must be per f rmed n tl ter th n from the thu d to th fifth d y The respons blty of g tti g pat ents b ck to th bas hop tal rests with the f rward umts and it m ans that pati ats hould trive not fate th f mth eco dt th fourthd , Her d ficult es nee fo in this ro ling warf re fi es of e acu t re stretch d nd u certa and t 1 m 1 alwa s po sibl to dels r pat ents to the bas less than eel. Forward ho pitals d e n t und rtal thei own d lay d utures u less they can bold the cases fr tlatten dys which may be imposible in times of stress distitches and ambul nee jo to ya

are incomp t ble Lawri R. Prire ry Closure of B ttl Wounds f th F ce La d La d 045 48 6

CHARLE BARON M D

In w und abo tth face may relos read fined as one in olving compo d fracture of a tral buccopharyngeal canties b t ther closures b w er large o exte s e are la sed s mm r Com plicated imples compleat which in utable makes th cas a lon term o e which must be seu

ted to base Primary clo re i ! cates comr ! t closure without dra ge f the facal of the Bose ble with free eath hurs. The ath noe m t f safets n which primary heal g three days may be consust thy chi ed

U d loc la esthesa w d to let i d ne th t is cured by hot fla in na ks As bout en tasu lase is the neath da d losed a the tout the skin a accurat I a tired and a pres um hid

p poled E ro tral clos res antral hemo t sis is occurred with very hit flas ne pick all frag mented bon and lacerated soft t th t has n function Limno to ce it chince laws at air mored mire alk seems dindu dirminel nil about rs gm | pen cill n | hazol po dr s fla e press re dies gus ppl dand th utures are remo ed the sec defined of uthe lave after which dessures reu II ometted. Mante le ha e mut n tree f rai ulf th every f the refe f td I cases fma dbu lar comm nut 7 in 1 g the tooth s ckets bon supp ration common diti fin we to dra
the wind Most of the cales his reported were operated o nat ted th tr th t the se of rowns a via es

With the method hir discribed an inerat w re do e 379 f wo d a d 134 of the e to the base Of the 170 p te t 14 had pr m ry wo ndels res of thes pres nt d m for une m pleat deases in hitti ed to duty aft a a wear Is days and with tifet n after twell redays 3 were cu ted Of th 4 p senting completed cases (oligh pas) all we warm ted a did of the 50 presents g m pleated min rw u ds 53 turne i to d ty after an a erag of f 2 d thre tenths d y and 3 r vacuated O e pate t of th g up of g with complexted m ring es d d

Ada ta es fth m thodare (1) q ick r c v ry ( ) red ct on of & fo th d ers (3) fewe empleat n Er kalos (co t n) tra dicat n partial 1 s Strall hld displisk gifts cab uedt clethe res dual skind f et JOSEPH W B

Ogil i W H S rgical Lesson f Wa Applied to Civil Pra tic B t 3f J 94

If th regard to po blies of apply g the lesson and reducthe war to thep blim for i prac-

tee th progres ga ed n this w r b fly as cor usin f three pha es I th first treatme thy the clo dol tem th ed wa the rul I add ton t th mm blizat n

with the treet pro ded by this m thed fe dramag a d th m th rapy were u d with skin safe and g es excel t results under desperate con dt s and hen tie w un led arr ve n numbers too great t allo f equent aupervis n after operation

I the cood phase winds were c sed and draid the him a summ ble cli a paldrd plas tereastor mef rm fiplist boxing I and suffer or ski graftin as attempted about the thind week ras so nas the surfice was covered with healthy granult is. This is med the best that could be in the period of its gromme cations a dipoor

tes I sutu e ra es dby the study f his gen al e dit on nd of then test f the first pration the dtelfn thigi pected rlt bdas yet. The pat ti ested f day during which nv dfc cy in b blood co t s m de up by tran lly adthn the fourth to s th d v in the perat gth t d f ll aseptic t al the dessigs rmoved the wild surfices bigls t bed as little poble although similars or picees of exposidit dil fit at the primity esin may be trum da y-a difthe woundappe est be elm cally healthy at the stag (en at hugh at my pr on culturet barbor path g n bater) tenb t ed t this time. The skim's brought i t ppost n by int rupte l sutures of some un be b ble mate I which m ; lo tak up deep l yers but no bu ds tr ed The limb s fi lly mmob l zed a d tım a plaster ca t d the at tches are r m d betw thet thand

In g neral th meth described; the thed phase f developm to the on whish Figla dis a troop of the transparent of transparent of the transparent of transp

t elfthd ys

n ed

Of co is thin ltars goo ha ga ed persone min, mitters pert gt ther thin piloperat sirging a diperhip him of import nt all a silve es k ledg ha hit dowith him

rhage and shock Plasma loss is the chief feature f the sh ck from burns and blood I ss 1 the ch ef feature of the sh ek accompanying ounds Plasma m y be suff cent after bu ns but in wo d ahock the lo t blood m at ber placed by bl od rly b f re arr parable damag as do e It mu t be replaced rap dly 1 at the rat fa pint 1 from ten t fifteen m nutes till the systolie blood pres ur has re ched 100 mm Itmu t lohe replaced ad qu t ly 10 t ll th restorat n is with n oo per ce t of norm ! If the patient is anem con admission to the hospital the blood defic ency shild be fully made up bef e the operati n is started. Cfi cal observ ti n sh that men with a hem gl bin of fess tha 70 per cent show I tile vi lence of repair in their wo is but start to do so after a transfu on of 2 p nts and that me whose blood loss has been fully rest red w thin a few h urs of wounds gueldom get gugangre If dur ing the peration b w ver the p tient lo es more th n th usual amo nt f blood r placement should n most cases be d ferred till react o t th ance thet e and operat v handling is over and his circula t ry requi em nts ea be assessed calmis and accur tely n the ward 1 blood dr p sho ld not b set going at the he inning of the operat n unless a

blood is ofat! ast 1 int: antic pated
As regards the lo so fip to ins in bum pat ents and
in cases in which the like is low as in starvat no
e c fllow; gite v rage; val did it the protein
co tent of the plasm si its fr mits; rimal 6; pier
co tent of the plasm si its fr mits; rimal 6; pier
co tofiet non time of than half off that mount and
r placement my be made d eterically with eggs
theses and other easily absorbed in the in. In th
It is my be made by translissions of pl sma or per
these described by translissions of pl sma or per
dam a trait enous administratif famino acids
e mbait; 21 or damage that bee sha bee.

In the field of ehem therapy it is believed that as soon as peneutlin can be produced cheaply and a stable form that can be given by muth the u of stable form that can be given by muth the u of sulform desirable will almost disappear mises fresh composed me found which will cover himid spots, not possible the sulform that the s

In concluding the ath radvocat the pyramid of possibility priciple in the terrelat nships betwith the individual physic is norvel practic which the midvidual physic is norvel practic. This should take the place of the free land in the of a often ogue with neglect 1 special ranging period to more the properties of the

perat e s g ry to und grad tes nd recommend the rt 1 of the ope at g theat r and th grad I nd rt k ng of perations f increasing difficulty f the postgrad test d twho i tends to pas i h gh qu hrat s nd ad pt u gery as a care r

### OPERATIVE SURGERY AND TECHNIQUE POSTOPEDATOR TREATMENT

Rensohoff I I. The Services Treetment of L'mohed m 4 k 5 c ou

The team nt of eliphant has been ri cone a d s n t fine e d b et log cal f et rs which the a thor classifies as follows ( ) flames ( ) obstruction f the rm I lymph ch nnels by inflammat ry r sc r t a d (2) b truct n of the lymph change's by some ob cure less n an

don the h truct The auth r bel es the p rat suggested by Handly in 1908 h uld be gy f rther tri I sin the kond leo prat tes a db m n

differe t results. The p meiple f the H ndley p-t t bury l g lk sutu es in th edemat s ar at smeasp m nentlymph cha elsa dt e d et the lymph ay from the feeted a

m llympheh nnel

Two caes ae pres td 1 wh h modified Handly p ration was p rformed Double tra d nylon were ed in pla failk a twe th ught they uld b les tr tat nd rem in th tissues i d fi t ly These tra d were th eaded under the s n rfici l (a ca th u h mult pl mail ics sal other oled temts with pec ally co tructed prob Almost mmed t im pro m t snoted with bide c fth willin The sno ecrt fm the woud a dth sults were grat f g D rolls R. Morro MD

Bown J B nd Cann n B Full Thi kn ss Skin Grafts frum th Neck f Fu ti n and Col In Ey I d and Fac R pairs 4 S g 945 610

Full thickre skin grafts from the a ch d cl c la rego are recommended f use in 3 ld d f c repairs becau e of their s pers qualtes f color m tch ga dfunet n Th is n t ralred n ss in the e grafts not fou din th ke dth thickness a d soft e s allo sf th best ki esis o functi n of the underlying m cles Late f cts

cell nt since there is m male tractu f th graft b d when the graft re ed

The scared or deformed area is disset direce d a pattern f th result g d feet prepared with phofilm o cell lod Th pattern is ma ked ut usually just bore this the dof the lack of the graft rem ed n the sual m The d r t my be 1 ed part ally d ed a d partially 1 ft pen reo ered tha plt graft

The graits are t in place accurated with int rupted sutures flight IL dithe ds fith tures relft 3 4 mehes l f s be q t fix t nore a waste form \ h les are cut in th graft whi h s co ered with fin mesh greased rauz and a wad f rm f wh t cott mecha es wast packed caref Il er this Appropriat

ppost pairs fut res reth n tied firml e th wast as th assista t compresses th form with his

figers or in truments

Dres mes reappl do thetherit s that s bseq to es repe ted s ecessary the munall left off about the tenth d y lin a w de x nerse ce with the technic e the uther report ill thek ess les Jos I McD to M.D.

An hro F P P | | Press re R pireti n ln th Treatment (Acut Pulm are Ed m 1- 4 S . 045 68 8

T o cases of acute p Imo ary edem are ported in which posit pressure respirat n thio yee was foll d by prompt clearing f the cond t n with recorder

The first pat t as a phy who took a re dise fisedat medication thin oht norm m

ing bef re perat on Re p r tory depress n [ ] the perate p oced re was sid red th i t I cause f the de pread pulm ry ed ma th t nsued I hal t force n by eath t r ma k a d t tfa ledt rele e therth eva os

The polication of positive pressure that he ares thesia mask resulted n switclar g fboth Th th rapeut c procedure ppeared t b th spec fi rem d lace t s or th sens of edema recurr 1 who the pres re was thera a daea dis appe ed whe th press re was re poled The n lmo ary d mag the second n tie to be

ably res lied t th m i f m the p mary trach al bstru to which ces tat d trach t my cause at the t be one of which ea ited a cre sed remat trapulm is pres The re m al f this ball ale pod cel som mpt m tinth pate t c dt b tsh w iterally drownignhownsct ntilpot pres r respirat dimmedbel, thild disimpl

app rat's was co truct d bich ff et d th promptly deffic thy
Sm threer fth ptntscidbe attributed d rectit t po t pes t s r comm d d that a m widesp p rat widesn d

the thrape t p cel be ad pt di c mbat g the thrape t p cei be ad ptd; c moat what so f q th; gad das at rm lel cal t the ghall a m n tratso f a bit th pre t n f ph; i form f death m make poss bl poort t s f re r; th t

w ld otherwis not be peee t

a w

# ANTISEPTIC SURGERY TREATMENT OF

WOUNDS AND INFECTIONS Brn BH lug RH ad MII C M W not ith kee Jit Lancet Lod 94

43 5 The treatm t pr gnos dres it of gu sh t w ds f th kee j t ta d th \rth
Africa campa m r discused Pat t wee I m tied t th hosp tal with T bruk ca t from tw g ght das ft ha g be w ded Pri t dms. n all f th m had had prim re tre tm t

which counsisted f

- a E c on of the nd ith ath first ! f ur hours
- b S tu ng of the 3no al memb ane when r pos ibl
- c Lone p cking vith sulf lam de an is ft par

d Admin strat n fp cillin intra art cula ly a d/or ntr muscularly

With frm twelve t tw nty f r h urs aft r admi so the cast was removed and the wound sp ct 1 O ly 1 8 cases as there frank pus n th joint cavity There was a rema kable abs ne f str ptoc ccal and staphyl coccal infectio M ou la c ntai e i c blo m b cill p teus bacill

and d phthero d bacill and some contained ac ob c bact ra An It mpl wa m d to else ry

layers Whe clos re of the syno in as imposs bl a effort a made to clo the capsul an 1st com pletely It as co lere i mor impo t t t keep gram positi bact a ul f the j t th t all dra age for gram n g ti ep swheh wually ul 1 be ereom by natural res t ee Mo t 1 th pa t ts ere r en a coo un ts of pe ic ff n th ce h urfs ( r f ve days

Of the 76 completely tured pwo ds 61 bc 1 d by first intent o Fo 1 nt conta 1 bacill cl pus at the time futur Thes 11 t a pirated s eral t mes b t all d el pel a In scaesth wu deo ll ot be l'ie molt! nda nusd l pel in ll f thes c es All told

16 nus w lected a lab h ft xm nths ssibl h lbc

All fo eig bod es if

m d at the p m rs operat For g bod i some dawe medit th ceks fter adm ss o 1 marble s df gn bods Ift in sty in a case f all a ca t became th eas finfectiono ir tat n dh dt b mo d atalatrit f may into programment The also haft be tend by a ury four it beautiful for the four it beautiful from the four it beautiful from the four it beautiful from the four it beautiful from the four it beautiful from the four it beautiful from the four it beautiful from the four it beautiful from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the four its first from the first from t atalateit f mayint c pe fel th mat n of a sinu

Afteth ptailtet ațit dit the e trem ty a large win1 w tei g 1 ft er th k jot t The cast w ally r m ved afte t days I ry often th Le jint em d'su fi f abo t ghtw ks Aslonga th j trm el m me ts were corag d In a cs n while the gold his twas a octel with hit ted they alp the extremity riquited reit I ats that showe I b c llus-col f ct de i pela if t arth to with de truct n of th a t culat g a t lag

Int a t cular adhes swe tre t I with pas t the g man pul tin und r th

en f w ca es by rth t my a d resect th fibro s bad FI contract res w re o m b tractio | tc trat hdt bee erted by me sof a St inm p th ghth th I t be tle

Of sor pati nts th s tr at d s had n rmal k ees is had usef I knees with a rage of mot bet cen 18 and 135 d grees and 11 h d stiff kne s GEOREIRI MD

Smith RO and it f d C C The Admit t tra tin I P nicillin by Co iin ou Intram s ula Drip J Loh Cl M 045 30 5

The proceed the study as to I tem gran titat vely the blood fe els obtas el by vari s! ages of pen c Il n admini terc I by cont in u i tra mu c lardrip and to evaluate the practic lity fith method th treatment of h ma inf ct n

The a the rafnd that the control u u i tramu cu lar admini t ation f penicill n aff rl a rract al meth d of ma tam g relations high concintra tons I penicill in the block but the tach the pe cilling eprt sn v a ail bl the ine i ce of local r act as at the site finjecti n ting at to w grant routs u e [ the meth | al th pres nl t m The blood lev is attained by the contintram cula d p are appr mat! I h s m a th se porte! with the cot u us int a en us method. This fet wild mit i deat that n gn ficant am unt fpe ictin i i traelat ih I tamu cul ste of m; ct Iti fi ter st that th same lin ar r lati n hp betwen I sage an l blood I clapiare the bt swith both the tra one and itr m clar rot Blood it as bgh s 2 or 3 u its per cubic c tm ter m v b e at si maint in db th inir m cular m th ol it greatel therefor that the thories a b mply dadva tage ut that the

fet ca s d hy r l ti 1 re istant b et a M eth n half ith nate to treat i in th pre nt ludy d loped l c l cto sat the t f the contin o s tramuscul injet ns Such loc l reacts h b d er bed bi pr solseriers It sho llb point d ut that r l li cly rul 1 reparati fpe cll ere we limith f tetuli and i the fully port l There is alread uggest e e l ce that the incline of l le by pope t all the purity fit pe cult cm plyel It is concernable that the nar future a crystall ne f rm f penicill n will be available f r th rape tou Ifm rehighly; rit lpr p raton fpen clif it ca l'ealr eti na at the site of nect the tuus at m cul method may be retai d just tably as a m n falmin st r g nte i e pe ic !! therapy

IN CIDMY ALII With and Rail RF 1

1 lillin by In hitin La I lad 945 48 65

Clampeacli m t prod liva bi und prenores ure a d'dmi t edt gh althi young m n wa ery r p fly abso bed thr ugh th m cous m mbra It was c mput I that half an h ur i halaten f the m tf man 1 1 g al pagimatilt fygnperm utal en taini ga trala no solt lpe clinof So one nits ne cub c cent met r w uld insure an absorptio of at lea t a coop un ts of the dry.

P nic llin mist of this d sty is teen rable with mit cause e ny dist ess pro ded thit then rest em of causing my distress production of the production of the men cells to derate s lect d II h b ct ost tic t t rs w re establi hed in the blood. The blood ral u sweegr test thee dofthe blat append and were reas n his elima the director hours Ma mum xc et on t ok nl ce donn th

half hour f llow g i h l tio

The wastage of material inv l d i f om 6 t 75 per cent but the high valies bt a die th blood and urine s ggest the po siblty th tw ler olu tons can be employ d for the 1 1 t atm nt of infect ons of the respirat ry mu o a and adv ce t t su s Acc di g to the a thors the m thod hould n ave helpful in the cu of br ch t nd branch ectas s and as a p ophyl ctic p ced re ara not se ondary pyococcal i fections fl ra

STERF A 71 W. M.D.

Pf iff C C Hallman L F dGersh l B ri Acid Ointm at Int ricati a / 4m M 4

Studes concerns g the ac t d h on c to effects f bone acid ere carr d out rats m source yes and down to com a postored to cquant tes from a tract appl d to h roed reas or to w nds 1 lng 1 o d mage to large areas of skin Wh n a pe t soft n is used to tring to ca t mot I th bonc a d is bsobd by the trees White the during the co when admit the ed n single la p d reneat d doses re ult a accumulation the bra in body fat The boron occurs both the white a d gray matter of lip ris of the certain coussystem and nether empheralmenes with the rigest amounts in th spin I cord a d gray matte f th cer brum The liver is only slightly aff t d h t l gically by chronic poison The kd 3 h stbl d generation while the han a d p al d h w uronophaga a d hyp ch mat s Th kn shows polym roh el a filtrat d as lar encore me t

P th log cal changes n the ce tral erv ussest m are n oduc d b as I tile as e third of the m d lethal dose by tr atme t fa burn inv la g nly a per cent f the s rface I the body with USP per cent time t When subcuta e doses of

little a oom m per kilogram re repeated dily fo rteen to ghteen days r eq red befo the urinars e cret on re ch s pl t a This t geth r with the f ct th t bonc a d ca st Il be f v d the bram of an mal fou d after d co to at o fa senes fd es indicates cumulat act la m mature rats ormal growth; retarded by o 5 per cent of bonc acid n the dn ki gw t After intra en us doses a defin t creas in mary phos phorus screttor occurs doe d ce wa f und f y depressa t actio n th blood form In th bran th boron fou d is not combined with phospholip ds or cholest rol When large doses are

or end athas deto a shocklik a drume Mod r ate dosare m en ov ra berod il sema prod ce death from ma tip du t en rul e t em re d m ngism Larg intra nude of te sol ti n of three chlorides and pl ma df +1 a tid t th t ic to but n such eff ct s produ i b mann t | g| co or g| ceml

Th authors co clud that bo ic r l whith r anni de thef rm fanor tmentors turatel of ton to e tens a wounds a a c mul to no He w ak antisent e hi sune ste that f rm le se other more act e a d l potent lly h rmf l therapeut c ag nts should be empl ve f

WALTE II NO MED

## ANESTRESIA

Ad ms R C. L dy J S d Seld T 11 1 rs f P nt th I Sodi m t tra n A d Seld T 11 T thesi An Eval atl n fits P t Pr sent F ture 4 th / fy out 6 to

An eval at on of the past p e t nd f ture f pe t th la esthesa made by the cleaf the ers f the ag mis. The olut n of tra a esthes rf t the tial nd tribult ns th that e best the e lut n of these c a d t f esthes loes I toth I thes be g d

thousands of im a day he physica do t t nurse a esth tists a d th ted pers I f the med calc m fthe arm df cs ft impoint re lize that it is cessary the a lible m tf the equipment essary f th adm t f fa hlaton nesth t he put th lisg n Fal proport fth moth d ty a d mortal ty a so t d

with trace sth P than th m t import at s I f to the that bee me app at wd by dweg t t letan of the pat t for th drug The age tp is tany more haza d s than a v oth a thite cases hich th hck He it dgo hnadm te d cord g to od ry sta dard din so-call da erage d s Us d l it h bee c d d tsfact rv 1 bd m al ug rv adms rg rv ith th tanks tts te

d dog spplem ntpetth l a esthes a its fild f ef l wide s Th m t ance of 1 rw y was f the e rl t nmhl m th tree fa esthes a d tha be largety sol d by the cr g of an 1 tr trach It be pre Id by thoccurt Ith th te fthedt in lict man he m

Wh naccessors m thod such a go ala th

the speed of dt ct n fth drug At th present t m the g t pop l ty a d we use fine t that soil m s ad t 1 so many untra dwrkrs the g t it importatt tah tserret dm trt ad ts dangers and him tatio s Or m st t h ts s

th average case wh h t is most tabl nd th

fn and mor specialized applications should be I it to the aperenced a esthet at 1 sol t n has becom outine in most places and em to have an advantage over the mor dil t sol t us th t the possibility of e ror is les e !

ppar tus which offers the gr atest oppo tunity s type of e ten ion tub g which permits singlehanded

adm nistrat on

The use of the combi ed type of intrav nous es thes a has mer as d steadily i mye r to year such comb n t ns pe m tting reduct n in dos ge and u des rable effects f m the agent Th ombinat n of pent that II calor rep alan ath a and th intrat ach al tub with the smultane us a im s trat on of oxygen a d nitrous o ide are b ing a d exte a cly today

I tra enous anesthes a a it is kno in today will conti u to play a major r le in a th Ral cal future changes and des I pme ts ill doubt b depend nt n the 1 I tion of n probably diff rent agents It Ik ly th t th e m ing years will see pent that's dium u din c mb nati n with more gents than it has ben in the past May KR MD

E ra le U H Spinal An th ia J Am if i

8 256 945

The man e ntra dicati to [ nat n sthesia i still the lack of experience fith prala e thit t Too m chempha i ha b en pl ce lo th select n ofth gnta Ithemetho! cith th skill fth adm n trator An app e t n f ome f th physical and phys I g cal fact rs : v I d n the prod e t n fadequat spnla esti of prim m 4

po tance The p chal sive tag f pinal nesthes a the attainment f working cond to s in the abdo-men n t cell d by ther method D sadvantages thed ff culty in btan g suffe theightt per mt work without discomfort t the p tent i uffi respirat ry dep s cent durat c reniato v d press on na ar tchigad mit g dur g anlp school cti on th p tof th patient and surgeon to the p tents being a 1

during th operati n

I ger! ting upper bd m al In ord r to h anesth's th maxim mic centrati I the agent must be alo g the n rve root s pply g th upper patofth abdome and t tth pnlpu tre

te in the lumbar are

Th anat me fact is not de th' i tribut o of the speal anothe a are receed rd to approximate the p obl m assoc ted with distribut ig the maj riportic of the another gint in the n ive roots t th upper; tof th abd m the same tim stopp gth ag ntshirts respirat re par lyes

The form which affec the cephaloli gree of the geticled the stoli jection the will me isoli jected the speed it ject nother mou jected the speed is ject n the mou t Ib bot geempl yed the diffu on f dinfl nee of gravity in the agent a dith pin I fluid d anatomic factors such as spinal curves and ar chno fal adhes ns By maintain g a c nstant tilt of the table ith the b ad down f m the hor zontal using a an th tirm tur of a con tant pecific gravity al asshe vie tha the pn l flud a d maintain ing const nt rate f injecti n n the same lumbar interspace the hight of anesthesia can be fairly accurately det emi ed by mpl vi go ly o e vari

This ariable is the time that the table and I to tackept; the hallown posit n Clinical expert ces in er 15 000 patt nts have hown that the m thod a highl applicable. Ten per cent d at se with a nec ne gravity of 1 oro is the in morio s s bsta c which i u ed as the diluent t make the ane thetic solution heaver than spi al flud O eperce tpo toca ne 1 an soto esolution I sod um chi rid s th anesthet cage tused The I si d I sag f po tocaine plus 5 parts of 10 per cent d atrose has a spec fe grav ty of app o imately o 7 Th th d lumb r interspace is the position fr the ject on hich is c stat at o 25 cc per

cond fixed g e of th Trend lenb g post on d the t me the t lle kept the posit det r my es th height of esth sia after which the tabl

13 lev led

Respirat is impai ment should be ree g zed im m dit h as the an sthesa p gresses e phalad The interestal me cles bee me paralyzed a d then th diaphragm if the urth cervical era is in ol ed Atth spot tth con ouspat tatt mpts cre s th siz I the chest ca ty by us ng ace s sory m eles fresp att if the coult nesn t f red hypo a e cul tory collapse a d de th m y occur M cha cal thythmea st neet res first on pl s the adm n tration I xsg is th b u tr atm ntf thise litio This pe od of re prat v d pressi n ratel lasts I nger th n fr m tw to t theto minutes

I fall th blood press is us. Ily tre te I by the int amuscular a lm istrat of a combinatio of sun to of p tres a das mem i phedone In the prese ce f a re f ll in th blood pressure from o e fo rth t e th 1 f this dose can be int a en u ly If th nau retch g and vom ting which occur d g the spin la esthesia are in re than in mentary the pitent sho li be re d red unco clous by the u 1 agent r by the intra ous administrat n f pen toth I sodium. The i tray nou administration of ite allays appreh ns a d rv s es The placing fa i tra e needl gre teaph o sa in n tth medial malleol m t th padalm t to ofstpertveft f as need d

With the nereas gues front u us sp la es thesia the need for uppl mentary anesthesia for longe surgical proced es d sappeari g

If a co 1ml I th a esthes I comlined with th jud s use of support e meas es nd uppl er tary agents ther are f w pat to t whom sp nal esthesia need be d nied f r s rg ry part I the abdom n MA Y KAR M D

## PHYSICOCHEMICAL METHODS IN SURGERY

### ROENTGENOLOGY

Il I y E II Rosenth I L N and Anson B J T mography I th Skull Rad of gr 945 44

T mography r body sect on roentg no raphy is be g used s c about 930 a d 1 grad ally but stead by ga u.g new d ocates. The m thod espe il luabl 1 the xam nat on f the skull lawn a d th ray

I 938 Leborgue vis ted the L ted States a d as sted in th des m and construct in at the Chi cag Tumo Inst tute of a tom eraph c apparates imila to one that he f rmerly hult i Urugu y Ths pparat has been d q ted described hy

Caulk elsewh e

The a thors at died the t mographe a et as of comp of the shall at amoust led in old freat views a did comp ed them with correspond a atomic set in Cada h asks in ricial is good states if preservation were used On head was placed in the posite tentor po into ind a other in the right isteral ind left i teral po it, a on the rocatige or applied table and torn "mans we made ato or mans we made ato or the head of we are not of a atomically the first the collection of the control of the collection

it mpt to duple cate as mu h as por M the tomgraphic lee b D to technical difficulties in cut tin it was th h thest t obtain the ast me seet ally t pro mail b) can le b I th poot naterior view the sections we recurred t to the proper section with the pool of the old of the the maning a choice of those does close a tornic tructures warrant a detail d deep pton

The rentgen eraphie f ctors were as f llows () for postereant no t m erams from 6 t 742 kp 100 ma 4 inches distance 2 secto dis posure th k p acreas gmm resproport at the distance from the table t p (b) for lateral temperams from 58 t 6 kp 00 mm 40 inches descended xpo the kp where in as

in the post roanterio new

The thors give a detailed descript fall to mographic of danat me cet in sat ari us le dis un givertain bony landmiks fithe shull as gauding points. Alt geth 38 figures re used fith pur pose of all trati

These tudes if the mai skull are aluable since they if mush the basis of companion with pathol gical t tes

The certa, MD

Lowman R. VI and Doff S D Arterlography for th Dem n trati n f Intracranial An urysms. Am J Rocale 945 53 34

Egaz Mo 12 in 192 int od ed intracranial p esent tw 2 arternorraph) and n 933 h reported th first is t ly well

demonstrate n of n ntracea la eurysm f th n ht i t mal carpt d artery by m ns of th m thod Since the many imlr eports have appeared in the l terature

In the b gin in thorotrast had bee ad ocated g nerally as the most su tabl rad pag e med um t was soon a pected that part from ts rather f eq ent to city and debatable raloact e effect the trast cau es an my ry t th walls of th ves blead gt actual occl trom a d L dre fr exampl noted cr bral thrombos 1 6 pree tof the brans heh came to ecr py alter ntraca ot dijeto f th rotrast Later therefo e d'odrast eo k od s lects nd ther p eparati mad f r uro raphy we substitted with tutwird eff cts The a thors themsel es desp te the f et that they ha ever obs reed any harm from th th otrat r n w u ng a 50 pe ee t solut n i d odrast e mpo dw th good tesult

Numero proe du es ha be de i ed f t k i grapid s n l a gogram th hest know am n them be g Nonie m rry goroud S ce th exam toon is carned tin the op rat g room the thore melor and for the thory melor

the thors mploy smpl fi d techn a g a portabl roe t n app rat Pr s m d f the rapid taking of lat ral oe tg nograms asmuch as this new h pro d to be grater alu 1 th d monstrat on of The f etors u dare 35 chesski taget d ta c 8 k 2 ma nd second po w thou w thout gnd Aprim an roct n ram m J t scerta the corret post on f the pt tad the the lizat n f th tra ran 1 ei cu It as earned ut by ject ng the t m ! et healart jes u der p per ept ce d t ms S bs q e t roentg gram a mad ft appro m t h th ce-q rters f th sol t been int od ced at t rval f th e fin! por begind at the dit le seco ds The jection is performed by the cro-surgeon Certal killilip ocedies goth secess for apd joth air described

s ccess I rapu j t n ar described
Th a th ts perice t d t 5 es
I order t d m trat the diffcultes co c r }
unth d gn f tra ran l a ry m th
describe a cas detail d p es t he g ms

The peoperate dawn ss as d6 to 0 th fifty first hospital day graphy we'd I asm chasthas eal dthepes for mass of m the maternal cat d ritry to see the fifty distribution of th

q est

ds.

\ lson O A Arterlography in R nal and Abd m { al Conditi ns J L L B lt. 945 53 \$

The a thor d crib s h s experience of injecting the abdom al so ta for th purpose of arteriogra phy In the main the technique de ised by Sa t s dhac orkers was u d It is impo tant th ta c ncentrat dop q e solution h injected rap dis and that roentg nogram he made s juickly as po s hl

s ce the opaque med um is movi g w ftly

A special p sure apparatus suppl d w than 18 g ug dle 1 cm long 15 d for th purpose of The roc tgen app r tus m st deh ma of c ent sinc the posu is made in one I urth of e second A 80 per cent s I ti n of solum 1 lde s emply d as a contrast med m On the alt oo before the ami t n the of castor oil in 3 14 2 of root ber then he is il wid nly loud inshment til aft rithe exam at The inject is sid ne und sodum pe tothal a esth sa Th n dl s ins rt d 1 th l w the twelfth ih a d about 3 hing h ith t the left of the sp us proc The po t 1 rected in ard and d ward to ward toward th boly of th t lith ertebra and fter the bon i re ch d i d ated laterally so as t gl de over the ertehr. Thin the stilet is thoraw the n dle is slowly d and d a few cent m t rs blood i coming the ghether pressure pparates attached and 6 or 8 ce f the contrast solt are allo d to run t th a rta The roentg posure is m de mm dist ly aft r th compl t

d th e dle is ithdrai lowelt can There are 3 p ble c mplicat s () scute dism theh may be a ded by the adm tra t not a mildly hypert csoluti such a coo c of g per ce t glucose n n rmal saline sol t with 200 its of v tam C this is gi en imm dat ly alt rth p tient h s been returne 1 to bed ( ) tra aortic 1 ct on of th contrast in dum heh ac codigt S to 1 of n rion co qu ce as Il b hso bed pont ly a d (1) the solut atravas ti through th Il p cture the c cu re ce of which has t bee ts rv d th hy the auth o S ntos Th s is ly nod bt t th tugg desofth to W The f ap poly perform I aortic p ct carnes n m te hazard

the jct on F lly the pr sure app rat to ct d a few c b c c t m ters I blood

than a si al puncture ra cystose p Th' auth also tried skiodan a d d odrast solut Alth gh th as opan m d e c t nt of these s b ta ces pro ed too sm Il for a ter graphy two nteresting sile-obs reat werm de (a) doda tpod reig t d h d osith renlp enchyma whith threalls r ogram a d (b) by jet gabout 40 c pe nt lodrast t th a rta cell nt DC tn Py I grams w r btas ed

tring phy lth bd mal rt go es

abl 1 fm t n 1 (1) locat n f th rga (2) art n I betru t (a) c rysm nd (a) re 1 neoglasm I e cases are described a dithe rrespec

tive roentgenograms are reproduced. The author s experience e tends to 106 cases w thout serio s un T L CUT A M D toward effects

Morrison M C. Roentgenological FI di g in Less r S c Effusi n C d M A s J 045 5 474

Ther sa paucity of r ports in the 1 trature on the roentg n fi d ngs of effu o n the l s r pen toneal sac Two ca es are report d by the author with th f li wing perti ent roentgen ind ngs

1 Adret shal weau d by flud coll ction in the lesser s c

2 A variable degree of d f rm ty of the pancreat c duoden 1 loop

3 Extrin cp ess re signs on the les r post

will of the stom ch 4 Displacement of the stom ch 1 lc ly a d t the lift the st mach remains pliable on flu to cor c palpation

5 Preservation I the mal the 6 Chest findings a mil r to tho e I any other

les and githe subdiaphragm Les sac eff s sish lib dife tated fr m retrope at I tumors | nere tie cyst oment !

cysts and sub l phragmatic bacesa In rder to arri e at a quick accurate i agn s s it s esse tial that roe tgen stud es of the chest ( t r post ror a diateral) abd me a d pperg tro int t altract be I M rezDSc

Gos man J W d Min Il II Roente n s man J W d Min II II Roent; Demontration fah Semiinr Cartilag th knee im J R It 945 53 454

The sem! ca til g s of the kne joi t may be is alzed cents negraph cally by a jecta grad luce t (gas u lly ir) or opaqu t opa sodium od de) e trast m d eith rs gly r n e mbina In the procedur with ut co tatm da is the r tge g phy of th Ance; tin force lab By th I tter preed e ta pos ble t lem strat at I ctorily the med al me ni cus i about 70 per c nt of the cases but the lat ral me i cus is v suale d rar ly

The authors by c mbini g th inject n f a mall amount I air with I reed belief 1 the Legit dun groetgn graphy were abl to sual ze both of th miluna cartilages sat s f ct rlv

The tech q is simple d ca be pe formed y oentgen graph c room with ut ho i t l zat i the pat nt rany spec l preparati n The i j c to n s m d just I teral to the p t llar Ig m t th gh the I gam at m mucosum f ll wing afl trate of the kin a d superficial beuta coust s ues with pe cent oca Ith u h lat ly th I cal a thesia is d pe ed with alt g th pat ntis the supepot with high age den are n't the roe ag og phe tabl Aft r th f d has t red the ; t much as pos ble fts thdrawn ilm hi pres t thin from o to occ. of two ph ricarfle fthr ugh s veral to choes es of ste l g uze a ject d l w s aled with c llod Frith policat n f th forced bduct d ing oet o ph th a there contract dit a simple dit to the I pme t () a de f mm h l mint whill teral tract nise ert din thel d

th h nd (b) ad ic for apply the lateral trac ton These a biefij de-c b d

Aft the ir: sect dth n te t pla d'nthe n nositio. The notes racimm bleaton m ladth t ctone erted by am r h h prmt cton fther sect d t thes de wh h b 1 s forcibly abd ct d By the p oced re th

mil area tlag th d fthei t z d The th immobile a dtract d ce s that the opposite leadth am m r ne telt vaualzeth the mi catle

Both m dala diat rale mp rtm to fith 1 ta oetg g phoith po den To e bett d trib to of the no + t is necess in to take cert i precaut in the po I the pate t h ch are described I th t po bl t d m trate all parts (a te d po t h ) f the lateral a d

med Is milion e tle d ttmes cate l ament

The fil are the clucal dates fall t f the em l ar cart l es () tw li perm t th recompt fanath | clm cu () twll deat whehe et | affect d (1) the led t

the establ hm t f t mport t f t -(a) th lat ral me scus; fra t d more ft n tha rally ble red and (b) may cales both cartal es

d m stat i to be p th loci (4) t m kes
po bl th t mation f the deg f dam t
e ch m especill as t frs t m on 1 tars d() tmish crucit lam ttars

a dp thol fth teular catl ge mente maeu df ll trat n T L cen MD

Krr ll D nd Einst i A J Result Hrrad tion f O arlan T m rs 4m J R entg 04

53 376 The a thors bel that cac ma f th t at d be t by mb ned r ry a d radiati th rap Duri th per od from 03 t 938 00 pat t ere t ated 6 wer betw n f rty d

Tho I w b redf t ri of bundred a duft hem th foms t to Fur cl ical gro p wer ed clas f

ta f the d as z Group I w compo ed f patie ts n h m th tre p m ritmrhdbee rm ed grop

wa composed faStrat to him thin hilber () nart I rem 1 fth tum () bl m t ree deblacitsa imale teell g p3 mel d d Spat tswith recurr [ mal deround claded at to the arabi t m m

In a nat to th t m halp a s it ch a te t that treatm t by sure ra 1 e ffere t

A cites pesent i 5 patients

Surn dne of cas la6 caes th t m r a ltrali 3 blt ala 1 4 n adable em ghet m t formet The nath les sa a labl of each lo ptetthtmrs eremalgat lina thrathe w pot till mignati c be g confasm ad ac nan pl t les er

nme e t I a cases pap lla es tail n ma The rema de fth tmrs 1 lelaft I s care mas tad c m otscul e stade mas z dvg m m m c

tm em ten nt derm te st t nim ! care m lend to dm telnotperatit

o n tr t dore perat l t pat t Of th tum rs wh hhad be ad t ip perat 1
3 wre las n d 1 call as r rabl h
f ll rrad t th becm per bl Three

il tel fth 4 rem gpati t h l Minat t treat dath oh it o ook p smm fepperpl mm fl m um Thracus filtrat ts 8 r2 ma

m um in racus currat tsor 2 ma s cm d tace doon to tch ft bld d l f ttld for t bld Bg 1010 t scm latal bld we ddd Twnth fipttre ed from t seed sof th raps

Therapy limit d ly by th k t l a c a d th rag tum r dos per cycle as bet n ooo a d 3 ooo roe tg
Of the or p t ts the mal gna t plasm 38

(4 pe ce t) 1 dh y rs a dr f the 25p t ts
w thase tessure df pe lod fh y rs rm
The th rs mpha the fa t that e ly c g

nut f ana cac om li cre thars l rat also thin t t c be applied t ny ere case—th t atm t f ache h libe d dalızd

The res its bta d the seres for sered with the sof ther authors. The cmb d e fs reety drad t res it d light m prem t the figrary ligrary lig

VI TOTOSO MD

#### MISCELLANEOUS

CLINICAL ENTITIES-GENERAL PHYSIO LOGICAL CONDITIONS

hempe 'I and Gibson S Accident 1 II nging with Reco ery J Pdat S Lo 045 6 4

A study of the report d cases of hang gwith re cos ry records st ki gly co s stent clinical c urse The sympt matology usually a cludes unco cous le sat on fr pration for a time f ll d ne

by violent co ulsim nd rrat onality tachica da rap ir p i s dy in gia aph ma co ti nec of urin d feecs d lat d p p is ele t i the t mperatur i ral day it r the h ng g a d complet amness f the e ent an l f the p rt d from three t ten days p rt the event Ree ve y salm tal s complet with utr silu I damage from the t furteen dy The tre tm t is lag lys ppot nelul gimm d t adm i tra i yg by t t rnasal cath t hype t c glus ginint ulyadselt thinh nb bital Thiph babtal should be tinu l i mallillyd sf may month ft clinic l

The ffects f has g a theef ld () the au pag ae shut off () p is appled the man blood ve el an l (3) th phren e nl agus nerves may mayn th cru hed The seco d flect pr bably the mest important a gle fet. The b tru t n to b ath g co t b te t th ce ebral noxem a a dth c mpl t c sat fresp ato i fmaj rimpot ei hether rn ts accl talkang gyrtim c b r f
T oca es fac l t l h g ginchlire with

Lope I M

e I M dLog OF ThPt in ftl Pim in Ilpt Obstructi I tru (La asd lpl m las t h p to-ob tru ) 1 h 1 1 ferm pdg 1 944 9 3 3 The mal ser globul đ th pl gm prthusa i If tfall t I fomist than it i d cates It lace fl h ch may b m fested cl cally by s p fact 1 65 es furn potperat dint fit bet nelma fleithes libal Thathrestull es I tru h chth daled t the groups-thelt hep tt r t the lit timical biruit a lit betruct by the Protiem was e m ed by of the b I rub n pho phat alliag test aledmtti frythreyt hall es li som is by th gal ct hpp cacl tests Tables g h gth dt l fth lt Ithes tests th three grop

fcaes I 3 Ith cars (13 pe ce t) the se Ib I thtwan rmal speted m tat n f th rythrocyt rm l Ihophtm a n rmal in only 6 pat nts (27 p c t) The Hanger test was egative : 8 jere nt \m ng 7 pat ts n whom the cess ca bobydrate test was made it as normal in (28 per cent) Only 40 per c t of be pat is were operat d The mort by in th the pat ts were operat d whole series vas 18 per cent (4 pat nts)

It is exilent that nicterus whether fu ti al r an t mical there is a ser us lefect in the hy r which ca be shown by vario functi al test it a con I tion ffu et onal defeiency hich acts on the prt softhen maalssho b hypoalbu i

nemia with version of the o ! bulin ou tent The a th is treated I ver function in the ricales by giving lit ch carbohydrate | d vitamins and small tran f n f blood 1 th

b f re an lafter operation M D

ilirshii id J W Abbott W E Pilli g M A II li r G G d Oth ra Metabolic Alt ra tl n foll wing Therm I Burns Effect fy rl tl n in Food Intak n the Nit og n B t nce I Burned Pati nts t h S g 945 5 94

The auth rs studies ere made t btan nore f mate nabout the change np t n metabol m b m I pati nts Th c rr lat n of the tr g n bala ce pat ts a 1 ts ith the u i 1 ry ect farkt til tinlke sl tanca g adt p a dest gn w u takn it a fu dth t nh ra lid burn Ipat nte ha a des ef m th n minimum qua t tes ff soil.

The 23 pt t ble to consum a fits lehtly ble to consum a fi t slightly bo eth rb s le l icr quir n t but frequently h large q ntit s f food we given u

I mental e f's n res lt 1 mit ng d rrh These sympt m sully or trd n tle first el Thype leg ril s f th ty foolbutw r most p ed | tients rice s | with te let by t b. Wheth r the sympt m p oduced by ces mou t fam no ac 1

cal nes e ter is t k n Somet mes thes patents om ted enough t lower mat rill ther caloric and n trog n i tak a c roum ta c th t cces t ted r n fth det Irths ra so s the p tem carl by leat n leal reintak f th pat is especial thise helalfire if i was not as co tant a l ired

Mi fthepati tec tedab rm llyl rg qu n ita fi e th nne Loptf f rece ed ab mally I ge quint tis Ip te n I ca bohy lrate all w r in negati n trog n bal ce The gat web I c a usu lly m tp n d n g th first t n days a d graduall deer a 1 th ft r Th pat ents who we in pr n cel e gat en troge b la 1 tw ght an Isome became

bly emacated Th ntogniftdint fleet the ch gest wight Atalulat fil ta prtnmtbolsmith 23 ftent is gi

Alth ghit was possible by means fa high calone nd protein t ke t pre texces loss f n trogen and w ght th el cal cours of th p t nts s medt leave ittle d bt that f ced feed ng with the typ of d t emplo ed is u desirable at least dun g the first to d vs after mury

It was co sidered th t m t burned p t nts if allowed t e t ly what they desire do not consume n ad quate d t Hence t is important all th sh ck phase f the 1 jury has pas ed to usist th t they eat's ficient fo dt mai tamp per utrit n STEPHEN A. ZI M V M D

Knt G T nd Difnd rf H W A Clinical Study f Sensitivity t Sulfathiaz I Am J N 2 942 09 64

Untow rd react st sulfo am de drugs m 3 b cl sified as f Il ws (t) d rect t c effects ch as vomit gand cyanosis (2) m h n cal ff t d et prec p tat in the um ary pa s ges (3) If rgs r act -hyperse s t ty such as drug fe er and ruptions

The auth is study was mad with w t d term gth time of appears c fe rta n all ge reactio upon primary adm tration f th ulf th zole as well as the ed ce ditm f onset of aller c react ft the readm trat o

of s liath az i

Pm yadm state Of 472 pte ts wb cer ed I course of sulfathuazole 1 exhib ted som form of re ction viz ausea and mit gin spet cent dru fe er n 80 per ce t sin rash a 207 t erstbema d's m co j et tis te al ompleat s a mia le e pe a leucocytosis delirium rthralgi d so ess of the balls of the feet Forty six p tients o less tha ne half of th gr up e h bited re et n wh th had to be con s de ed as due to sen itivity and f these 38 had drug f er The fever occu ed between th first d th days with a sharp peak of me d th ni th day

One b dred and thee pa t nts ce ed sulfathiazol n two cca 5 Th int real bet cen the t curses w from the t on h deda dei hty dys Of thes p tints 2 eth b ted s n t nty re t ns All wh d I ped drug f er reactions on the first dm strat n of If th az le again d 1 ped drug fe w thi tw d safter readmin trat Th t tal medn of drug f er w s m re tha twice that which occurred in the group I pat e ts wh had ec ed h t co rse of t c tm t Th h rtened period of t m in which se e dru fe appea ed (the econd day of eadmin trat on) por ts tow rd sens trast n uch sen t zat n was ma ifest upo e dministra

t numless n d shadelapsedf mith beenning f th first co rse of t eatme t Singl d sare had no influe e the i c de ce f react ns The d ta presented by th a th rs stro i s pnort the thess ad a ced b Lo cope that these

all rgic reactions belo g th sam lass with rum ckness

The ser a.ed number finited is who were n t e readmin strat th carl rappearance of drugf er a d the m m l terval f ned necessars for its des lopm tar pes nted s d cat ns that s itization is pod ced by th 1 t l dose of s If th azole 1 men J Lt

Bl ck Sch ff B The Pathology f A phyla i Du to S if namide Drug | h P ik Ck 945 39 3

The u ersal use of s life am de compou ds a d th d c 13 that they my act a t gens capabl of elet g fatal et ha e f r the fret t me m de po ble th study f larg numh r f la tively I w but fatal a aphyl et e c et ns Fi e cz.es of a phylact c dcath ( !! g the th rapeut c u e of s !! amide c mpou d re p esented in th eport as will as a interest ig and c moreh esume th theory f aphyl ct c hock I m phasis is placed upo the f ct that lirry c react can be el c ted by no prot n drugs

In se eral the cases e cha a t rized by t rel ted les ns at nal cha g a d ge eral d cellul r exudate The arte I les diffe ed n appearance but all w fi ct of a l e r progress on from s mple ed m to fra k necro d t which ded th connect t sue k th nipel the med ste m th gastro test al tract and other orga s w s s m la nall espects t that's no th sm llera t ses Its most pr m nent compo t was a macr phag po sess g I ge mon t f yt plasm dd spl eti phag cyt is Its l'us was ccentr alle st teda dism t mes re mbled a pla m e lls clo 1 that o ly the p es nce of trans t 1 tyr d the phe ome on of ph c cytos m ded ff

t at m po bl It was appa ent that th rt ral f th cell la les ons d the compos t b ned the e ct n I these pat nts 1 ll ng th adm trat fulf am dec mpo d m tar t those sc e p m t l anaphyl The theory is present d thet the le phage ev

ts adth eryth oph g cyto rp t f m of fr ga body react on in h hthe h m lg u blood ils res chagd by the alit faubt (peh; ac jugat i i f m l | g p) that thy b com li t th pr te p ttern f the pat t Sch a hagemy cibly c ri the enyth cytes t the le cocytes t all g bodes wh hi ad to a phylete h k S MUTL J FOG LSU M D

#### GENERAL BACTERIAL PROTOZOAN AND PARASITIC INFECTIONS

Frezze A C. Elkes I J S mm Il G Gova A D T 2 d Cook W T Effect [Clostel dt m W t hil T) pe A T In Body Ti nd Fl td Lance Lo d 945 45 457

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Clostrid um welchi to cau es rap d destruction fthe red blood cells hemoly as may occur clin cally b t b then thi sed e to y 'rect a to of l c th a c or is caused by the po d et as of t sue bre k d has n t yet be est bl h l. The other ha ges the blood co sist of fl cculat on of chylome s a d the beak g l l pop ot l complete

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m ki g ffect of the e reul ting t th blood Clostrid al fat imbol sm is of ter st becau it m y be imports t in the path I gy f el tr lal ni ctons a d becau e it my th w m ight n th m ch ni m by which it mbol m ca cour in the surg cale dit The mboli ftm s ng t i th free f t wh h slberated f mal nlm eles a d can b se a l tge pose t gl bules in tr st des a d the m t al from the ste ftss e destruct rit m y ngin te from flocculated chal m crons an Ith f tta m te al set fr f om broken I poprot in compl es Tx pe ime tally the seems to be not be the tente femust be dened from the stellocal destruct n The preise mecha in by whith fit glb les nt r th blood stream i still n t el I the fat n hum n subject is mo Iffe It to de term esp c lly ee som I th ca es Iso p nt fract res I te s e f t mbol sm h If tely e rain huma be gawh h frac tures Wheth r t floccul t fltp rtieles

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ach d se of p cillin; the tratment of gonococcal u thriti. This study was und rtaken with a view to d termin the e act point of bact r log cal cure within the l mits of the unit of pen cillin ed

After a culture study of several th usand cases at an all aboys teat the authors have found that el meal cure is tnecessarily deat or obacterily ending in a mars a en ta very rel abl means of establily days a sand d m n trat dit tultures are from red pendable frith spurpose I kewis some cultural meth days are spent to others.

In 944 Miller Scott a d Meller stated that the total mount fine ellin rig red did not exced po oco u t and that all ca es respo ded to peni cll and recured from a clinical nd bacter log cal standpo t 4thin f rty-eight hours. The authors fun I th r b ervations at vara ce th this r port. For sime time they objected that a coccal preth its w re be gr admitted after ha g re ed the sta dard ed l ag of p cilli (100 000 unit) Each I these in hindu is hid been d sch ged as elimicall a d baeteriolog cally eure l S ce ll of them had b n restricted f r tw ty-o days following p seell n therapy on a crein f et ons. All i the p tients had reported b ek with nith tie ty-o e-d period A prelim ars tt mpt w m 1 by the auth rs to test the b
rvat ns Cultu es w re taken n a wh 1 blood hem lyzed blood pl sma agar med m 1 73 ca es In all of these cases 00 000 u is I pe clin hal jected intramu cula ly 1 do es of 20 000 u t e sy three hours A cult t Lenin ach ca e th eco d s venth niffteenth days aft ? th rapy This pr I m a ry study sho ed 13 bacter il g calfa lures ( ? 8 per cent) t rang per od f tm fll w gth rany

I order to ver fy these p eliminary be rvations vest gat wa made to test the ff cacy f the t tal 100 000 units of I sage One h ded a 1 th stee p tients with gonor ecal ur thrit who were eith t sulfonam d c tive or ha bored s l fon m de res tant train f th gonococc recei ed pen ling des 1 ooo unt a jeted tra Il u tleach pat th lrec ed a com plt deag of occood t i prostat cult c as taken in each ca a lm n to th w rda before pen cill n th rapy wa t ted t er fy the d gno Urethral cultures w th take thr e h rs f ll w g the i t l d se a i bel re each cceed g dos f 2 000 unit Foll 1 g th in cti n of the fith fin l 1 1 pc ll nagr t cti nof the ffth fin 1 1 tt cutt e was taken li th f al pro tatte cl cally cured the patient is I schirged t duty If w onl light duty was permitted f per od ft d fn allt n ca h pat t was ecalled f r p ostat c cultures n three eces week but ary g fa 's Veo tant pers n wa j n bl ea h case nee ch pat nt wa Ir re st ctio frt enty-one dy nth t poss blts of

Alth h twasposs bl by mea of a high caloric a dip oten intak to prome eres nels of n trog and wight the dicaleons fith pit is seemedt lea little distinct of feeding with the type of detemplo ed su des rable at least dinner the first tend vs. after interes.

It was conside ed that most burned pt is if llowed teat I what they desire do not come a ad quited it Hence it is important after the ship kephas I the jury be spased to isst that they eats flictent food! maintain proper thing.

STEPPLE AZ IN M.D.

K nt G T nd D f nd rf H W A Clinical Study f Sensitivity t S lfathiaz 1 Am J 31 S 945 09 64

Unt wa dre et n t ulfo am d drugs may be class fied as follows () d eet t fleets such as m tin and eva () mecha caleffects d to pec pitat n th urin r) pas ages (3) all gic react o s—hyp rsensitivity s ch a drug fe nd erupt s

Th authors study was m de with a riw to dit rm i githet me fapp ce of certa ller gic rectio supon primary dm tration f the sulfathaz le as will as the incidence a dit m fost fall ge eacto fir the redmi tration fifth.

Pim y admit i ion Of 472 patt ts who rece ed rouves of sulcharbole s he bed some form freact o success and mt g. spector ct dru f ern 805 percet ts rash no p c t rythema dosum co put ct ts at complext a mus le cope to lecocqt s delinum rhraign ad so est of the balls it therefore the receive free dosum co put ct ts at complex ts must be some former of the success and complex to the success and the complex transfer of the success and the success to the success the success the success the success the success the success the success the success to the success the succ

One hundred a d thr e p R dm d sulfath azol n two ccasion ti nes int real b twee the two c urses w s from t one bund ed deghty days Of these pati ats 2 exhibited n t to react All who d lpd react as a th first adm istrat rime fe sulf th zol aga d eloped dru fe with two dm istration The total c de ce of d vs ft dru fe was more than twice that which coursed a the g p f p tie t wh had ec ved b t i curs f treatment The sh riened period f t me n which s ere dru f appea ed (the eco d day f readm tratio ) por ts t w rd sens tizat uch se s t zats n w manifest upo administra t nunless n n days had el psed f om the beginning of the first co rse I teatm t S gle dos ge had n influence n the me de ce I eact on

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d te which ny ded the co ect et sue f the ki the re all n l is the med ast um the gastro test n I tract and other orga s was s m la all respects to that seen in the smiller arteries. Its m st p m nt compon nt sam croph g po sessi g a la ge mount of cytopl sm and d pl ct ve phag cyt is It I was cet call s tu ted a d t som times es mbled plasm e ll so cl sely that ly th pese c f tra t nal types nd the phenom n n f ph rocyt made d ff t tion possible It s ppare t that the tin l les a nd the compost n of the c llul r h red athere ct fthe eptent fll faulf am de omp nds th admin test smilatth een; pmtlaaphylar

The theory is present of that the left control is a different by floory this represent in of fore misody to not not heart to be successful to the control in

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### GENERAL BACTERIAL PROTOZOAN AND PARASITIC INFECTIONS

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n ereded the sble les on the cheek hich wa d co ered at the age oll rm nths fn th th rd ca the time of a creased adren lact to w

In te the s gn of 1 m vere les c picu u and the diagnot for 1 sm mi ht b q est ned S precocts is more f q e t in the fem 1 1 1 ilsmi th fm lesign fease rv alanli om jarabl with sex procity in the mal lt sm fested; all 3 pat to by cha g f ce he sut manenlredeltramaculn trand

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p t d Reg Ing the op r ti e al proach to a d n I tumo the bd m alies ffers ral ad untag s If the lumb ro t ed both I m the op ned to loc t th tum a lt 1 that ne adrenal glan i is normal b t thr i ce a ca the explor d 1 sm ll inci at th 1 1 lof th mbilicus perm ts aplor ti n t d t rm e th locat n of the le n If an a h blast ma s fo d in an ovary the inci i n e b ten l d d w i to po the ovary sati i et ly If an dr altum rist u 1 th inei nm 3b t ded pward d th adren l glan i can b pp ched satilact rily. There ghe ploration find salu ablifemt til tilbelck gith lumb Ŧ. LC 1 VID re u ed

#### SURGICAL PATHOLOGY AND DIAGNOSIS

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Am n fl ty threy ars ntr ! the auth serve t th Ral m I titute thasmil od l in the right m ll phary ge l sp ce wh h h ed th h ract st cs f a s mpl solt y d pathy Il haln ted then dul s m th l f re it as hrdaiheth ghtit wad ntal al t liag w cept I 1 300 roe tg t R en thut flet aft h h th t m a r I su g cally

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h st jes of 42 of these cases an 1 a tne bib fography f the s biect ar presented Alt gether about 8 or oo ca es ha e been publ shed

These tumors g nerally ong nate in the par til gland b t may or g ate in the submaxill ry gla d or th upp part of the lateral reg f the neck The r h stology is deser be l in d tail and illustrat d with ph t micr graphs A DREY G M BOAN M D

Leboren R I tracan ilcular Blopsy in P th log Ical Processe of th Mammary Gl d (B ps po faed calcult l p sospilog d l glidlamma) d h p obst 11 l 1deo 944 3 33

The auth r desc ibes a method of intracanal cular bips fth mammars gl dwh h part cula ly us f l 1 nath l g cal 1 roc sses 1th dil ted gal c t ph r us d t n a the n pole Il ther s bleed g from the nippl roentg n tame at n is first mal t d term ne the site of the lesion There i on no bl wurce f fror in this exam at

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caes a describe f and ll t ated with ph to graj haa diplotom or graphs of thi operat in spec m ns in il strat ni alcop es nted which sh wa n neorrect t ch q 1 wh h bubble 1 a 15 t I cel with the inject of the jaqu tacadm b mit kenfra intranal cular

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re-expo ure II a pat ent r turned with a post to bactern logical culture the same routine was II wed and s nal cultures were mad until each gratient was defin tely padeed to be be teniologically cured with 3 newati p static cultures r a per of I fur nh'oned wy followin the hatd e of pen cilin Allof thes ca.es w re treated \_asn le ward and were d rectil u der the authors super

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returned to a di pensary f r addit onal therap The results of the e perimental study the the senal ultures of the 113 p t ats a th g nococcal rethrit's show that contrary to som pre ous experimental reports the d sage 1 00 000 nt 1 pen c ll n d es n t insur a 100 per nt b t mo-i pical cure Only p c t f th p tients w e bacters lorncally cured with 100 000 units W th creased dosages 89 per cent we e cur 1 1th 200 000 units or pe c at with 300 000 units and on pat ent was cured w th 46 000 units After the u e of ad quate dos of p n c llin n bacteriolo ical fail res we e encountered No eo r the threm nth pe od durin which th study was be a conduct d not a sn l te dm n from this e per m tal or up as noted f llo ; th three mat ecultur made ver period of t e ts-on d vs The re ult clea l d monstrat that no t e cultu es for the gon e ceus m s app ar from tw t in te da s followin a adequat th rap th pe clim

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M. THE J. S. FERRI M.D.

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CHARLE BAR M.D.

#### DUCTLESS GLANDS

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W T H NOLE MD

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In this series of or families a single apparent ex cept on to the theory of 6 all he genes was shown to be d e to illegit macy These data comb ned with previously published res its by the authors make a total of 10 families with 463 child en which have bee tested for the Rh blood types The sat sfactory arre ment bet e the bservatio s and pecta tions and r the theory just fy the med coleg lapph catio of the Rh tests f r the e clusion of patern ty HR FRT F TH STON M D

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in the course of a land timy for eles on of a car e oma of the neck of the na creas the port I e n was acc dentally one ed and it was fou d th t th t mor had inflt ated the sein Cop ous hemorrhag resulted and it was n cessary to transect and I gat the portal and superior mesenteric v s The pa t at dedo the leath post perati las of h l peri

I t psy revealed no evid ce f a y as lat d sturba ces due to po tal tra . ther wer n mer us veno nast mos t the oot of th m t ry belween th mesenteric s n1 t deals te g the inferior ha ea a th re w also a ast m ses betw en the po tal and ca al ci culat s 1 the spaces of Ret 1

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re ly g and tmal co dita m th 1s nd h lf m nth respe t af r pe to gl edthreed ys dthe ded agen 1 d perit nitis Ird gwas sa f ed alt apened Ithrice d ; t co frmth ab n e

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HOSPITALS MEDICAL EDUCATION AND HISTORY

W Hs D B The Circus Disa ter and the H rtf d Hospital \ E el nd J M 1945 32 6 3

This articler ports on the part pl yed by the Hart f rd Il smital in the care of vict ms of the c reus dis aster of July 6 1944 The importance and eff ct e th stype of em rgency as the oughly demon trat d I less than fift rmnutes 125 human b ings mo than half of them child en under fourte burned to death on the lot The rarious h spit ! 1 Hartford adm tted 183 thers of wh m 150 were burned 43 of these subsequ tly ded In all 86 in a gratie is e brought to the flartford Ifoso tal and 51 burned pat e to arrived with there minutes Only 10 could b trated as amb I t v

D sast t prep red ss cons ts frst fp d on t belter fo the s ctims and facilities fo effe tem g cy tre tm nt Morph ean i blood nla ma in adeq ate qu nt ties a e ess ntial th ra peut c requirem nts \ sufferent number ft incd perso el must h ava lable on short notice an l'ar rg n d pt fession I staff is necessars. Th au th t dese bes how each I the 1f f q I filled th Harti rd Ii 1 tal

The first floor des gned to b u ed ltim t l as an o tpatient departme t is con t ntly m ntai las a properly I cated ad quately protected e mpletely eq pped Truge Room whrae ad rable mb r of casualties of my type can be ass mild a ide f t e tre tment ; It t 1 th t f ti il n disatt Here : bd kplc ta tly m leun At ther end te i ek es co ta g Il n ecssary rn rgency app ratu Th oom eq pred wth tlty hopiers o ygen i ppedd etly into it th re

c tral sueta n h vy-duty rubbe cover lel e tre cabl s with a m m ltif | flug rec ptacles are on the floo Down thee I are tw a r con d to ed m g ney perat g coms with complete pres estring q pm t rdi th u ed as cy tose pe rooms lite a i n the regula con d t rooms th cas alt es w dm tt 1 nd r ed the rin tal m iph ea 1 pl sma laborat re d t rm ti nsw remad a dw nlsw d es ed Itim t Is th pat ents w re tran I rredt the wards s these

these t pt receive th m At an earl d t th citize f flartl rd had made co trb to t p ; for a cach of 2 700 p ts f fro en pl ma which wis 1 st rag at trat g pontsaga ts dlen u pected dema ds le ha d sa ter O th d y of th circu fi e abe ut Sgllos I pl ma wer g en tray g part f th pla ma blood and lectrolytes it theremely Red Cro s nurses a 1 s uly tra ed and n org uzed g p 1 ter b ness nd proles al men known as

med cal a fes met the sh t g f tra d rofes s alperso 1

tumor Cultu es we made I small bits of th tumor free of bone. The techn que of cultivat on s described. The h torn's llustrated with pb tographs and r nigenograms of the tumo and photomerographs of the tum rissu and est refi

The authors co clud that the en et e !! of these gi t cell tumors of bo e ong nate f om soune or mm ture mesenchamal cell f the bhoblest c type. They no ease in the hy renested discounted the bucks without any orresponder d son of the protoplasm rather than by prion r con fluenc of two o more m nonuclar all of the st oma The authors ca not as whether the dist on of the nuclei takes place by mt is or amt si as they ha e not been able t ob ery in int ninted de lopment i gant ell Ho e fom the ah. alute la kof m t s n all the stages b th the d d obs ry they hel that the d r on is and ttc \ith than t on ther h rate ha b n able t see any typical or atypical mito es in gant cells a td nars h t l cal ct ons Guant cell were to med non disable numbers a their cultu es es n th u h ther po bon a o tend tissue in the frac ents ulti-ated. The uthors think that the f ct a gues gan t the theory that gant c lls hav an steo la t c fun ti n and th t th tumor is not i rmed by osteoclasts wheh after ha ing finish of their o k of destroys of the trahecul of the spoors bone and co t a h e ree conflu nt and merea e n n mb r s Lubarsch ela m d Ar RE G Mo . M.D.

#### EXPERIMENTAL SURGERY

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#### HOSPITALS MEDICAL EDUCATION AND HISTORY

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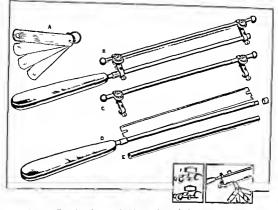
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# SURGERY

## GYNECOLOGY AND OBSTETRICS

An International Magazine, Published Monthly

VOLUME 81

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NUMBER 6

### SEGMENTAL RESECTION OF LESIONS OCCURRING IN THE LIFT HALF OF THE COLON WITH PRIMARY END TO FND ASEPHIC ANASTOMOSIS

Report Based on Fifty Cases

JOHN M WAUGH MD FACS and MONFORD D CUSTER Jr MD Rochest r M nes t

ADICAL cure of malignant lesions and other serious surgical disease of the colon dates in large measure from a report of the first exterior nation operation performed in 1805 by F T I aul in Liverpool Ingland This proce dure later to become more cenerally known as the Mikulicz operation provides a moder ately radical curative technique which can be performed in the most expert hands with a mortality rate which has been reported in recent literature as ranging from a low of 4 b per cent (Woolf) to a high of og per cent (Gibbon and Hodee) Other figures include Cheever 19 7 per cent Mael'ee 27 9 per cent and Vordmann 28 per cent Babcock and bacon (2 3) in discussing this operation in 1943 ascribed to it a mortality rate of 166 per cent However with the advent of chemotheraps including the use of succiny! sulfathiazole (sulfasuridine) in the prepara tion of the bowel there is little doubt that this mortality rate can be and has been revised downward so that a figure somewhere be

tween 5 and 10 per cent probably more nearly approaches the correct one

Developing concurrently with the foregoing method there has been another type of resec tion consisting of a somewhat more radical removal of the lesion with immediate restor ation of the continuity of the bowel by means of primary anastomosis. The first succe ful operation of this type was performed by kohler in 1881 The Johns Hopkin school has contributed materially to the development of this type of one tage procedure Beginning in 1910 with the intro luction of the aseptic anastomosis by Halsted it continued with the report by Viller in 1923 of additional cases in which this method was used and led up to the recent excellent work of Stone and McLana han In December 1012 these authors re ported data on 104 cases of resection for car cinoma in various locations in the colon with primary aseptic ana tomosis and in most instances without proximal colo toma the 104 patients 11 died thus the mortality rate was only 10 6 per cent Others who have reported preference for one stage primary anastomosis over extraperitoneal resection meluded Lockhart Mummers Allen Chee

From th Division of S zery M to Ch. dith M to Founds you. cethi paper's written D (user has er ered be arm itsens et al. now Cap. MC At

ver Joll Gibbon and Hodoe Mayo and his co workers (16 17) MacFee and Woolf

A somewhat analogous situation ha devel oped in recent years in regard to the surgical treatment of those lesions of the lower part of the sigmoid the rectosigmoid and the upper part of the rectum which are odistally locat ed as to preclude radical removal by exterior ization. Since the introduction of the Miles operation in 1910 these lesions have been effectively treated by combined abdomino perineal resection or by the less radical posterior resection in one or two stages. Effective though these procedures may be they both entail sacrifice of the rectum and phincier ani with the placing of permanent rehan e on an abdominal sacral or permeal colonic stoma Supported by the pathologic evidence furnished by Gilchrist and David and further extended hy unpublished work of Glover that curable malignant lesions of the lower part of the large bowel seldom if ever metastasize in a retrograde manner various surgeons have contrived procedures designed both to cure the disease and to preserve the phincier The most substantial proponents of this more con servative type of operation have been Babcock and Bacon (2.3) who have developed a modified abdominopermeal resection and Dixon who has recently described in detail his method of anterior re ection

For everal ye is resection of the right hall of the colon has been followed on the service of one of u (J M W) hy immediate end to end aseptic decoclosiomy with very satisfactory results. Within the past 13 months we have applied the identical technique of aseptic anastomous over a three bladed (Rankin) clamp in re foring continuity of the lowel after resection of lesion located variou by between the miditansiverse colon and the upper part of the return incluive. This report deals with the first 50 cases of this type of resection in the great majority of instances.

The oldest patient v=s 78 yr is and the youngest 1, years of we. The average age of the patients w=s 1,5 years. The age range is the customary one for a group composed mainly of patients safeting from mahimant lessons. The types of patholom change en

countered were carcinoma 43 beingn tumor (hpoma) 1 localized megalosigmoid tubo-ovarian abscess with involvement of sigmoid 1 diverticultis 1 beingn stricture (post radium) 1 incarceration in ventral berm 1 – a total of 50.

#### LOCATION OF LESIONS

By virtue of the location of the lesions in the colon we have clas ified the cases as follows Group A comprises those rases in which the lesions otherwise vould have been removed by extraperitonial resection. Group B comprises those cases in which the lesion otherwise would have been removed by corn bined abdominoperineal resection (Fig. 1) The term rectosigmoid requires further definition since everal of the standard text books of anatomy make no use of the desig nation By rectosigmoid we refer to the segment of the bowel , to 4 centimeters lon at which the lower part of the sigmoid joins the upper part of the rectum and which is situated at or immediately above the pen toneal reflection

#### PREOPERATIVE PREPARATION

Preoperative preparation of the bowel is of especial importaines since it is our considered opinion that primary anastomosis should be performed only in those cases in which the origin decompression has preceded the operation. It has been a welcome surprise to 1 in a very small proportion of the ceases unsuit able for this operation. Credit belongs to be medical and nursing personnel of the medical colon-ervice who have supervised the preparation of most of these patients for surgical treatment.

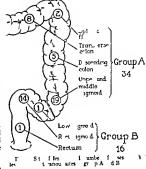
The important features of this preparation consist of (1) subsistence of the patient on a residue free d et for 3 to 4 days prior to operation (1) oral diministration of socium plo phate (3) repe ted irrigations of the colon (4) rectals a pirations combined with the administration of camphorated incluse of opum (pare,oric) for 24 hours immediately precedin operation and (2) the oral ingradient of succurp buildisthiazole in the amount of 20 grains 3 times a day preferably for the entire 4 day period of preparation.

### TECHNIQUE OF OPERATION

Group A Tor lesions situated in the mid portion of the sigmoid or above the bowel is nescted widely above and below the lesion and a correspondingly wide wedge shaped eigment of the meantery is excised with it The anastomosis is then effected over a threight bladed crushing clamp (Rankin) using one row of No ochromicized catgut reinforced by a second row of interrupted sutures of No sik. The mesentery is then reapproximated and the posterior and lateral peritoneal reflections are resultured. The incision itself is then closed usually without drainage.

Two technical advantages of this method over extraperitoneal resection are at once apparent Tirst the bowel may be resected more widely since no portion of it is advanced to the anterior abdominal wall Thus local recurrence and particularly recurrence in the scar of the incision (a fairly frequent compli cation following exteriorization) are mini mized Second and also for the reason that the bowel is not brought forward the node bearing mesentery may be resected more widely and approximation of the mesenteries is facilitated a step which prevents internal hermation Nodal involvement incidentally was discovered in approximately half of the cases of carcinoma (21 of 43 cases)

Group B For lesions situated in the lower part of the sigmoid the rectosigmoid or the upper part of the rectum the technique closely follows that of anterior resection described by Dixon The bowel is first mobil ized and devascularized in exactly the manner that is customary in performing one stage combined abdominoperineal resection. After ligation of the superior hemorrhoidal artery the lowel is manually freed posteriorly from the hollow of the sacrum and if the patient is male anteriorly from the pro tate gland This is an important stage of the procedure since it is here that the surgeon must pause to decide whether le is to proceed with abdom inoperineal resection or whether the growth has been mobilized high enough to allow eg mental resection with anastomosis. In our experience lesions of the recto igmoid are almost invariably resectable by the latter method and le i n ligh in the rectum itself



occasionally so In 1 instance open anasto mosts was performed while in the remaining 16 cases the aceptic technique described previously was employed

Colostomy Protection of the suture line by protunal colostomy has been advocated by Dixon Rankin Woolf and others Stone and McLanahan found it unnecessary in the majority of cases the exceptions being those instances in which ob truction was present

In our series prophylactic colosioms was felt to be unnece san; In 4 cases pressou it established colonic stomas were present and were of course left open and functioning until convalescence from the resection was complete. There of these colonic stomas laid been established as emergency decompressive measures and the fourth had resulted from the exterior textion of one of two distinct and widely separated malignant lesions occurring within the same bowel.

There is little question in our minds that colostomy is an unnecessary addition to re-ection performed for le ions of the signified or above. However our feeling in rigard to its use following re-ection of lower hing lesions is not so definite. We have found that there is some tendency to the devel perient of

edema in and about an anastomosis which is performed after resection in those cases in which the bowel has been freed extensively from the hollow of the sacrum This we feel is the cause underlying a tendency to the development of temporary partial obstruction in the early postoperative period. In a cases in which operation has been performed since the completion of the series that we are reporting this difficulty has been obviated by passing a tube through the rectum and beyond the anastomosis This tube has been left in place for from 7 to 10 days and has thus far been effective in eliminating obstructive phenomena It is our intention to employ this tube in the future in all cases of resection of the lower part of the sigmoid and below In this way we hope to omit successfully the addition of colostomy to the operation per formed for group B as well as group A lesions

#### POSTOPERATIVE MANAGEMENT

At the conclusion of the operation and before the patient is removed from the operating room the rectum is thoroughly dilated so as to admit three or four fingers. Other means of ensuring patiency of the lower part of the bowel such as the insertion of a rectal spool were used in some of the early cases. They were found to be unnecessary. Patients expel flatus pontaneously within 48 to 60 hours after operation and the bowel ordinarily functions quite normally thenceforward. Patients on whom signoidoproctostoms has been performed frequently experience mild diarrhes which ordinarily subsides within a few weeks.

Administration of succinylulfathizable in full doses is resumed as soon as the patient is able to take it by mouth. This may be on the day of operation if the operation has been performed with the patient under pinal anesthe is otherwise it is withheld until the second or thrift postoperative day. Enough water is allowed with each dose to enable the patient to smallow the tablets. Other fluids are withheld until flatus is freely expelled. Residue free hquids and solids are then employed and continued for the first weel of feeding. They are then succeeded by a low re idue due! The amount of food is increased.

daily so that at the time of dismissal from the hospital (esually on the fourteenth post operative day) the patient is instructed in a very adequate maintenance type of low re a due natale. He is advised to follow that on a general way for 2 months and then to bleralize it.

### I'wo of the 50 patients died giving a mor tality rate for this series of 40 per cent. One

of these died of atelecta is and extensive hronchopneumonia which occurred on the fifth postoperative day and failed to respond to usual measures including parenteral ad ministration of sulfadiazine sodium in ade quate amounts. At necropsy the anastomosis (in the rectosigmoid) was found to be in excellent condition. In the other case in which the patient was an elderly woman a fecal fistula developed as well as an associated retroperatoneal ab cess which drained inade quately throu ha stab wound which had been established in the left flank. Her convales cence was prolonged and at several interval we thou ht that she was on her way to recov Two weeks preceding her death the fistula closed and subsequently her bowels moved normally through the rectum. How ever as the result of the combination of madequate drainage of the abscess with exten sive cardiovascular disease and a terminal pulmonary embolus this patient succumbed

The moriality rate for the two groups 1 and 81s 9 per cent and 63 per cent respectively. The hi her rish associated with the lower group of lessons is probably a real one because of the more extensive procedure involved. However the mortality rate of 63 per cent compares favorably with that of Coller and Raussom (89 per cent) and Fanisher (52) per cent) which occurred in the abdominoperimeal resections and preservation of the rectum and sphinder was still accomplished.

on her forty minth postoperative day

#### PALLIATION

In 6 cases hepatic metasta is or nodal involvement beyond the limits of resectability was present and resection was considered a framlly palliative procedure. We feel that the indication for primary anastomosis is if any thing more certain in such a situation than in dealing with curable disease since these patients are spared the burden of colostomy life during their remaining months

#### HOSPITALIZATION

Thirty of the 48 patients who survived the operation underwent primary healing and were dismissed from the hospital on the four teenth postoperative day. The average period of hospitalization for the entire group was 21 4 days Further analysis of the latter figure however reveals a decided difference in the stay in the hospital between the two group A and B Whereas twenty five (74 per cent) of the 34 patients of group A left the hospital within 2 weeks only 3 (31 per cent) of the 16 patients of group B were able to do so The same tendency for a more protracted convales cence in group B than in group A is evidenced by the average hospitalization times which were found to be 30 r days and 194 days respectively. This discrepancy is related to and dependent on the development of peranastomotic edema and a localized type of cellulitis in the anterior sacral space. In tho.e. cases in which the bowel has been freed from the hollow of the sacrum there is protracted low grade fever and the patients are fairly often annoyed by the frequent discharge of irritating semiliquid stool The local edema and inflammation subside however over a period of weeks or months. Only 3 of our patients mentioned a persistence of symptoms when last heard from It may be that this tendency toward inflammation about the anas tomosis will be obviated by the use of the rectal tube as described previously or by establishment of a temporary proximal colonic stoma as advocated by Dixon

#### COMPLICATIONS

Complications of varying degrees of everity developed in 10 of the 48 cases in which patents survived Fecal fistulas developed in 3 instances all closed pontaneously 2 in 3 instances all closed pontaneously 2 in 5 weeks and 1 in 6 weeks 1 n 3 other cases all from group B an abscess anterior to the sarcum developed. This abscess drained through the rectum. This complication led to 2 pro

longed period of ho pitalization but ended with complete recovery in 2 of the cases. In the third case the abscess was draining extensively from the rectum when the patient was last heard from In one case in which a portion of the sigmoid which had been involved by a large tubo-ovarian abscess had been resected extensive edema of the anastomosi developed. We feel that the edema was relat ed to the original infection. This likewise necessitated a prolonged (77 day) convales cence during which period the patient suffered considerably from cramping abdominal pain and had a persistent fever. However when recently heard from she had undergone sub stantial improvement although her cramping pain has not as yet entirely subsided. One patient required reoperation on the tenth postoperative day. This was necessitated by the development of a mechanical obstruction of the small intestine which we found to be due to an adhesive band at the site of a former appendiceal abscess Infection of the incision occurred in one case. We relate this low incidence to the preparation of the bowel with sulfasuxidine and to the use of an asentic anastomosis The final complication was a nonfatal pulmonary embolus the patient was a middle aged man for whom palliative resec tion had been performed. The development of prolonged urmary retention a familiar complication following combined abdomino perineal resection was conspicuous by its absence

#### SUMM IRI AND CONCLUSIONS

Primary aseptic anastomosis was performed in 50 consecutive ca es after resection of lesions of the left half of the colon. Two patients died giving a mortality rate of 40 per cent.

For lessons of the middle part of the sigmoid and above this operation provides a safe curative one stage procedure the hopital convalescence from which seldom exceeds 3 weeks. This period compares favorably with the mainimum of 8 weeks close supervision and the 3 or 4 separate procedures involved in extraperitoneal resection.

For lesions of the lower part of the sigmoid the recto igmoid and the upper part of the rectum this technique provides for the eradi cation of malignant le ions with pre-ervation of the lower part of the rectum and the phincier and The average period of ho pital convalescence from the operation fantenor resection) is approximately a month

1 Preparation with a suc invi ulfathrazole and aseptic analtomo is are factors in reduc-

ing the mortality rate 2 Primary and tomo is a the procedure of choice following resection of lesions in the

nonob tructed bowel , Proximal colo tomy i unnece sary for lesions of the middle part of the armoid or

above 4 Proximal colo tomy or prophylactic de compres ion with a rectal tub. is indicated when le ions of the lower part of the sigmoid or below are removed

#### REFERENCES

ALLEN A W J Am. V Ass. 93 00 9 Bancock, W W and Baco H L. Amb 943 46 253 6

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### PENICILLIN THERAPY IN ABDOMINAL SURGERY

### The Results of Prophylactic and Therapeutic Use in Fifty Cases

GEORGE F WOLLGAST MD FACS Leute nt Col 1 MC AUS Denver Colorado

THE objective of this report is to point out a limited but definite field of usefulness for penicillin in the pre vention and treatment of abdom inal sepsis

Penicillin has not been generally accepted as an effective agent in the treatment of infected surgical conditions of the abdomen Thi con clusion is due in part to the few brief and un favorable reports of its use in peritonitis Lyons in his summary of cases treated in vari ous United States Army Hospitals states

Infections arising as complications of appen dicitis have not been responsive to treatment although one patient showed improvement coincident with treatment It seems how ever that in the few cases reported patients were treated late in the disease at a time when the infection was widespread and the prognosis poor Jeffrey in his discussion of the use of penicillin in the British Army remarks that

Penicillin is usually not of value in penctrat ing wounds of the abdomen most of the deaths in such instances are due to physiologic cal causes In addition cultures of the e in fections although frequently mixed usually show a predominant growth of gram negative bacteria which are not sensitive to penicillin These nonsensitive organisms also produce penicillinase which inactivates penicillin

(Abraham and Chain)

We administered parenteral penicillin to 5 patients critically ill vith generalized perito nitis. These patients presented the usual pic ture of terminal peritoniti with such compli tations as multiple intraperitoneal ab cesses paralytic ileus hepatitis pneumonia and kidney damage Treatment was started late and was discontinued after a few days because of scarcity of material All of these patients died The only indication that penicillin ex erted any favorable effect in these patients was evilenced in the temperature graphs There was a definite reduction of tomperature

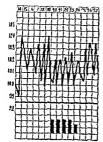
very closely associated with the initiation of penicillin therapy in every instance (Figs 1 and 2) Because cultures of infected material from these patients contained both sensitive and insensitive organisms this temperature reduction was attributed to some inhibition of those organi ms which were sensitive

In many open infected wounds of the ex tremities numerous species of bacteria were isolated from cultures and as in peritonitis the insensitive bacteria were often more prolific. It was found that when the sensitive organisms in these wounds were controlled by means of penicillin healing did not appear to be impeded by the continued presence of the insensitive bacteria. In peritonitis strepto cocci or staphylococci can often be isolated along with Escherichia coli These penicillin sensitive bacteria may easily be overlooled in cultures due to the rapid overgrowth of insensitive organisms Ladd and Gross frequently found a mixture of organi ms in peritoheal cul tures and it is their opinion that teriology in cases with ab cess or peritonitis is variable. In many such peritoneal cultures there are doubtle's important organism which are lost light of when there is a luxuri ant overgrowth of colon bacillus

In vi w of the pathogenicity of gram post tive organi ms in other infections we believe that these penicillin sensitive organi, ms play a greater role in mixed infections of the abdo men than is commonly attributed to them Certainly the inhibition of these organi ms early before the infection has become wide spread should be a factor in the recovery of certain patients

#### THE EARLY USE OF PENICILLIN IN PERITONITIES

Twelve additional patients with peritoritis were treated more adequ tely than were the e in the first cases mentioned Treatment in the majority of these cases was initiated at the



F Staphylococcu reus and indentified gr m egats beth. The p is temped to so all treat ment's duco ed

time of operation Seven received local treat ment and parenteral therapy a received par enteral therapy only Local administration in a instances consisted of instilling so oco units and in 4 other cases 100 000 units of penicillin into the abdominal cavity by means of a catheter just prior to closure. This peni cillin was diluted with 30 to 50 cubic centime ters of normal saline Parenteral therapy was adminitered intramuscularly at a hour intervals. Dosage was varied from to ooo units to o coo units every 3 hours totalling 80 coo to 160 000 units every 4 hours. The duration of treatment was quite variable. In a instances there was evidence of reactivation of infection after penicillin had been discontinued and an additional course was administered

These patients also received all other ac cepted therapeutic measures Origen was administered the electrolytic calone protein and fluid balances were maintained distension was combated by continuous gastine action and the maximum benefit of sulfonamide thereps was obtained (Because of the set too sandtire of the refection in these patients we did not feel ju third in evaluating pennellin without sulfonamide administration).

THE S and low daily attentions of temperature only are recorded.

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Focusated submit represent as all ones.

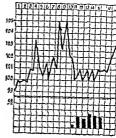


Fig. Caphylococcu a reus d Eache chia coli 1 temperat re red ti 14 degrees occurred d. g feni h. dm m trat. I ti 1 sp. ed 45 h. ra l t

The usual numerous laboratory determina tions were made but only the similicant or unusual results ar included in the followin summaties

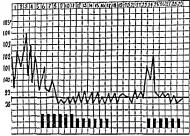
Cast a Male aged 8 3 are as admit it with be but may alpo not got just drat in Herre a history of having been perated upon because of a history of having been perated upon because of a trup red Meck 1s der til mis 50 er pg. 1 u ly Temperat it will a degree puls 1 2. The but was most artich d 1 and d Tendermes marked of er a sear in the lower mid abd mit it of a firm man spalp by be mat this has a The bud been no exacutin it spale in Glass of 18.5 bud been no exacutin it spale in Glass of 18.5 or 1 maximum continued to the continued of the care of the spale of the care of the spale of the care of the spale of

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dite peration the timp rat levated to a great he has contically if I en cilin was start do a the 5th postoperation da

This patient received adequate sulfonamile therapy prior to administration of penicillin to other changes in treatment were made at the ture of pericillin administration.

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Fg 3 Case II m lytie Staphylococcu e d Esch rich a coli

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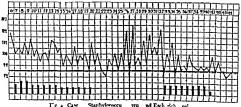
At operati n a gang eno s perf rat i pp day was f nlan removed O ricco c buc t tme trs f seropu was aspirated fr m th abd m n Pen eill n was a lm stere! I cally ( coc ts) and continu d par terally

In Case 2 sulfadiazine and penicillin were administered concomitantly and therefore evaluation of penicillin effect was difficult However during the second febrile period sulfadiazine was administered for a period of 6 days with little improvement. Then a se cond course of penicillin was apparently responsible for immediate temperature reduction and general improvement (Fig. 4).

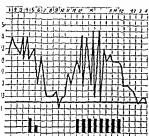
Cast 3 Female aged 23 years was admitted mitter mplaints finausea duration 4 days and 1 wir right q adrant abd mi alipain duration 3 1 ys net g adual Temperature rose to ro4 4 de yeer p ise as 126 Th pat ent was exhausted has 1g travelled the 5 d ys prior to admission. Shwelling severely

I diagn sis of a perforated append x was male and this diagnosis was confirmed at operation. The append x was remixed a diffalk drainage as in stituted.

Preumonitis d veloped on the indipostoperatice day. There was no impromint from sulfadiazine



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In Case 3 penicillin was administered for only days on the first occasion. It is ques tionable if treatment over this hort period of time was responsible for the marked improve ment (Fig ) The second n-e in tempera ture was associated with absce s formation drainage of which did not appreciably after the patient's condition. The administration of penicilin at this time produced marked general improvement although there was no temperature reduction for a period of a days

CAE 4 M le a ed 29 y ars wa drested with acut abdominal p udden a net durat a 4 h urs T taperatue w d g ees p Le 1 S Tend mes a drandity whi hw pres t th o gh o t the bd men w re m re ma ked in the right l werd adrant

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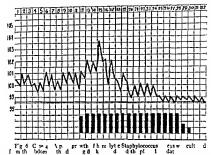
On the 12th po top rate ed y posten r 'ra I the subdaphragm to abscess was contemple ! dpen ell nwas it stedas a preoperat m Ther was sufficient improvement ith nath is t warrant operat a delay It thin a days no a d t nderness nith i rie ne momil Th t mperatue had how c i cea it 135 de grees Add to 11 x ray pet reserved da n rase in the sea f de ty in the refit thest spirat nof the refit ple raica ty as dine n th 6th pot perat day cocub cee tmtrs f el udy blood t ged flud b grmo d O th s me occasion a ood units of he cill we en pected intrapl utally. The timperata resided 1 1 d gr es the fl wa 1s3 Aspuratio me to code to reacted o the 12th oth a d 3rd po toperation d ys Improment (F 6)

In Case a simps of a progressin subdia phragmaticab cess deappeared during 4 days administration of penicillin Neverthele's the temperature continued to me and the signs of pleural effu ion increa ed although the patient was received 160 000 units of pen seithin daily. The pleural infection was not controlled until penicillin was administered directly into the pleural cavity. The isolation of the same or mans in from three different sites leaves little doubt as to the pathoneness of the pleural infection

Cases Wile and opers w admitt i th 6th day I llow g apped t my Utr operat he had a penist at 1 t a ft mi m t e (100- derr es) O t 8th post perat dyan transdem thesw de Itth hist imperat r ra bet a d ord O the 4th pest peratt was dyp t 1 h mol dir th ht spe bdom na dl wern hichest Th ent t ported t rht i h mt b lvtlat n ed A pl ural ff wa prat It w th

co se of all co sult t that as be aphragm t becess w s present tot d Th 11 On dra. pe cal w tr gua woul er tm tm flaff in a purated i m th n ht est Clt es it

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although the temperat r m ne l elevated fo a add t al 7 day fte heh it rap dly declin d lle wa allo ed up n the oth l y ftr tme tan l recovery was un entiul there fte

This patient showed no improvement following chest aspiration and no reformation of fluid It was believed that the pleural effusion had little bearing on the course. There was no change in treatment and no pus was evacuated from any other site Probably a subdiaphrag matic infection was aborted by penicillin

Casr 6 Mal ged 3 years develop dar troce cal bacess on the 6th day following ppe d e toms There a sociated signs of g erals ed p tit neal irritat The ab cess w s d a ed but n impr eme t esulte! Abdom 1 t d rnes andrigd ty increas d d p ralytic 1 sd elop d The termy raterel at dto sdg s Fil ng th dm trat lp icling terally the abd m 1 gns gradually dec ed The as capp ble decle ft mp rat efr

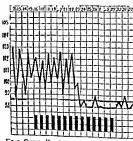
The infection in the patient was progre sive in the face of all other therapeutic measures Arrest of extension of the infection was closely associated with the initiation of penicillin therapy

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Case 7 Wal gd343 are 37 la potat mus ad 1 ped ile att ch fdiarrh a wh h pers ted lie sadmit it a th h ptal 25 days itr At that t m h pal a d cachect th abd me w s moderat ly d te ded dt 1 anith i raif ti lgi

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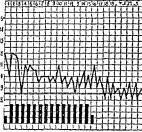


Fig B. Case B. Staphylococcus reus d Each rich

purited from the shoom n. Th. r. w. marked pern tel. each in Op ratic exploratin of the otte d. est e tract e ealed no perf rat n. Th. dome it the tight be of the! e rwas fluct an and as collection f. pl. stic erud te was noted in thus area prat n. p. oduced thethe pus. App. rently, spon is coust draina e of a.h. r. abscess had occurred. A mush oom eatheter was is serted throw the hist raiche twall; to this abscess can it. No choosehold the pus. r. cysts we fel u.d. nit wacusted mat rail. Cultures f. pe toncel and ab cess matemals endogen the services of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of

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His gen ral cond t on was poor de entually he
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To mo the postopeate ely h de el ped pural flu o a d n le ated t inpent it e Or prati na el jecto 12 oco is I penicillan int the r ht pleural cavity pe e ted fur her account to cultured from the ap rated rast nal and wa also cultured from the drain I above.

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It was concluded that low improvement in this patient was probably due to extensive liver damage. Penicillin was effective in abort ingemogena in this patient. Cust 8 Male aged 22 years 5 days pr r to ad wiss on d ell ped cramping abd m alpa who is creased a city 0 the spid viol line becomplaint increased became raiseated a control equant. If was admitted t a ther hap tal a directed conservat. Spins a small bowelobst c too there was no mpro enert.

Hew soperated pon hoursalter trans! r Three black gas revous loops of lieum w re foo d wh the abd men was open d The obstruct and transulati w resecondary to these ontaith side and la appendent m. C. of a rable find present nd there was le large 11 testinal content. The gar ree oas bo el was ram ed and a dub barrelled i costom was done. Penul in was gw nocally (52000 cunte) and court y raborally (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and cot ucl part transcalls (52000 cunte) and contents are considered to the contents and contents are contents are contents and contents are contents and contents are contents are contents and contents are contents are contents and contents are contents are contents.

The postoperative course in Ca e S was sur principly satisfactory. The wound did not become infacted. Due to the high location of the ileo tomy difficulty was encountered in maintaining his nutrition and in preventing skin crosson. Subsequently the ileostomy was closed and a transverse ileocolostomy was done. Recovery was satisfactory.

CARE 9 Mai ged 17 years w s und d in th pel 13 a math ne gun buil t was a tuated between the bi dde a d the smood coin The onfice of a drain gs us tract which coin ct d with the life e m bod was per tin thinght penneal ren He bad parit b structin nis eral pocession

He was be gp pared fr peret n by the administrate of per Unparenterally asserblasteen in the total sustant Hidde engencies assert the tract before profile mass nell done one of III mg this imagation hidden for a bedominal pain I llowed by increasing grant of perit not a sand text. I obstruct in

At praten ma ed perite eal rit in wa fu d thick attail deum we shall deu fu the bow! wall was the k and edemat so One loop with the theory of mend the roof fan abscen which the for 'm body wa imbedded Thick pu was eventuated from the abscess and the bill was rim ved It was necessary to diareset in fabrill to inches felse dama et bow! Ad bill bart lit leost my was d'attheended the perat nico on its pee ell we in rected it about on the coll we in rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the coll we rected it about the collection of the collection of the c

The path of was entendly limm distely firsthers a bit espo ded rapidly. Postoperat temperatur was to decrees no elocate not leading about 90 so degrees thereaft in The wolld for the pentile all irritation files to be designed.

In Case 9 cultures from the sinus tract grew on various occa ions diphtheroids Staphi lococcus aureus streptococci Bacillus 1300; aneus and proteus. The course of this patient was even more sati factors than that in the preceding case. It is reasonable to conclude that some inhibition of this mixed infection should be attributed to penicillin

CASE 10 Female aged 22 years housewife was admitted complaining of constant generalized abdominal pain. The onset was sudden 23- days prior to admission a d was cramping in nature gradually localized to the right lower quadrant become g somewhat relieved after 18 hours it was the gradual formal and hours

again increased in severity and became widespread Examination re caled moderate distention the abdomen was rigid. Pressure and rebound tender ness were mark of throughout and somewhat accen

tuated on the right

A diagnosis of acute append citis with possible perforat on was confirmed at operat on A gangren ous perforated appe dir was removed Just pr. r to closure 100 000 units. I penicil n were njected in trapertioneally. The indomen was not drained P icilia was to tued pare terally.

Th temperatu e was ioo degrees on e occas on the day I llowing operat in but d d not go above 99 degrees thereafter. She was allowed up on the 2nd postoperati e day and was discharged i om the hos

pital on the 8th post perative day

It i interesting to note that the postopera tive course in Case 10 was as uneventful as after the average interval appendectoms

Cast: Male aged 6:3 ars tod ys protoad misson d veloped sudden abdom: aler mp g The folloing day hen ted tenderness: the ght lo er abdome O adm sson the bo ecompl nis west ill prest at din add ton he not d eakness and anorexa. Fxam at nre caled a tender fix d mass internght! we q adrant.

A diagnos a fappe d ceal abace a was confirmed at operatio. In establish g drainage in the ght flank considerable puis was applied it to the abd m inal cavity. Smears abo ed gram positi e e eqi which were not id tified and Facherich colicultures grew only the latter o gan 5m. Pentel In was a spil di locally (100 cool units) and continued

parenterally

The highest postoperative to imperative was 100 degrees. It return do no imal on the 3rd post per attended at which it is the post tent was allowed up. Recvery was uneventful to pat ent being discharged on the 16th dip of his postulation.

Spillage of pus into the peritoneal cavity during an attempt to drain an intra abdom mal abscess is an indication for both local and parenteral penicilin therapy even before culture reports can be made

CASE 12 Female aged y ars w s admitted compla g of sev re lower abd m all pa grad ual in one t durati n 5 days. She was n use ted and const pat d

On examination there was found general zed ten demess more marked in the right lower quadrant. Pelvic examination was painful but no abnormal ty was palpated Smears from the cervux revealed only occasional pus cells. There was defin te right lower quadrant.

A diagnosis of perforated appendix with general ared perit this was confirmed at operation. The appendix was removed and too coo units of penicil in were injected into the addominal cavity as the abdomen was closed. Cultures grew only Escherica coil. Temperature was too degrees on the first postoperative day subsiding to op degrees by the end of the und postoperative day. This past ent was ambulant begin ing the 4th postoperative day. The recovery of this patient was universified.

The postoperative course in 10 of the e cases was unexpectedly mild. Of the 3 in stances of pleural effusion 2 of which were in fected none developed empyema.

Intraperitoneal local administration appears to be of value and there is no evidence to indicate that penicillin should not be ad-

ministered by this route

The cause and extent of peritoritis is so variable that a small series of cases such as reported here is insufficient to afford conclusive evidence in so to the effectiveness of the drug in this disease. However, the improvement which was so closely associated with the initiation of penicillin therapy in these cases is presumptive evidence that penicillin was at least a factor in their recovery.

It is well known that penicillin is more ef fective than the sulfonamides in controlling the staphylococcus (Powell and Jamieson Robson and Scott and Fleming) Laboratory animals can be protected against intraperitoncal injections many times the minimum lethal dose of various organisms by penicillin as proved for hemolytic streptococci by Hobby Meyer and Chaffee (5) and for sulfonamide resistant pneumococci by Mckee and Rake and Robinson In view of the frequency with which staphylococci were isolated from cultures in these cases and considering the pathogenicity of this organism in infections elsewhere it seems logical to conclude that penicillin is the drug of choice for combating this phase of the infection in peritonitis The efficacy of peni cillin in staphy lococcal infections is of impor tance not because of a special sen itivity of

staphylococci but because of refractormess of this type of infection to sulfonamide theraps

Dawson and Hobby ( )

No cases of primary peritonitis were en countered but considering the frequency with which su ceptible organisms are the causative agent in this disease it is probable that here penicillin hould be the chemotherapeutic agent of choice

Effectiveness of penicillin therapy in these infections appears to be directly related to the duration of the infection. This clinical experi ence substantiates the very interesting recent experimental work of Faules and associates These naval officers produced peritonitis in dogs by heating all blood supply to the appen dix (All animals that developed internal fecal fistulas were excluded ) One group received intramuscular penicillin within a hour follow ing operation the mortality was o per cent The second group were treated after 1 hours the mortality was 21 per cent. The third group received no penicillin the mortality was g Spercent

#### PREOPERATIVE AND POSTOPERATIVE PROPHYLACTIC ADMINISTRATION

Twenty five patients with infected wounds received penicillin both preoperatively and postoperatively as a prophylactic measure Eleven colostomies and , ileo tomies were closed Seven sinus tracts leading to foreign bodies and 4 intestinal fistulas were excised Extensive urgical procedures were required in several instances. Hermal defects associated with enterostomies were repaired at the same operation

Treatment consisted of parenteral adminis tration of 10 000 units or 1,000 units every , hours intramuscularly for an average of , or 4 days preoperatively Treatment was con tinued postoperatively until the patient had been afebrile for at least 3 or 4 days. The average duration of treatment was to days

The postoperative course of these patients was very gratifyin" The local reaction was minimal in these operative wounds. In no in stance did a wound become infected or drain purulent material. The average pos opera i e course was milder than in similar patients the same to ditt as prior operated upon u

to the use of penicillin. Ore con the attention eocountered following the closure of a colos tomy On the 6th postoperative day this pa ticot developed an elevation of temperature to to2 degrees and there were associated signs of peritoneal irritation. The d sage of penicillin was in reased from 10 000 units t 0 000 units every 3 hours and sulfadiazine was administered intravenou ly Heimprovad rapidly and his subsequent course was unevent ful The dru which was to ponsible for the improvement could not be determined

From this limited experience it is suggested that definitive operative procedures on con taminated wounds may be carried out earlier and with greater safety v hen penicillin is ad ministered prophylactically

> POSTOPERATIVE TREATMENT OF INFECTED SURGICAL CONDITIONS

> > PIDALBIE

C se 3 Mal ag dathe is wa perat dupe i another h p tall t a perl rated gan in pe dix Pot perat eli heh da lahtt mp rat le at on O the 9th day a sm ll : c as deam d The t mperat ema dbet stand adges H had ghts et ndem pl : ed of weaknes O the 8th | yh temperat to 1 13d ees dthis sth tola ptc co ree a thealy el vat n b t 101 d gres Th at te blood co tws 8 000 neut phils 78 p cent nd h moal b best dunte chilocented in the galaxy Theret a eader edig thath he a were foll wed by profus duals es Malaxem is and it aggl unat a test we persit the neg ti e Adaga sis fa i gpil phi bt m de The e was n respon t the s is sport maues to uliathuzol therapy A purst n of th 1 d o th toth pot perated y film t the hest d mi m tdm trat disc tn negati m d therap foct a ested t er org Hewstranf It th bill th 49th post pe t d ) H i t m ly eat t m chill gat states dals Th d b

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Within 24 h rs I the tate I pe cal It to write ha thrap 1-1

r man d between 104 and 105 degrees for 7 days 5 ad ally reduc g th reafter to roo degrees or 1 ss by the 16thday f tr tment Treatment was crusted f r a total of 36 days the temperature remaining ormal aft r the 30th day of treatment. Recovery rascomplete.

No improvement was noted over a 7 weeks period prior to the use of penicillin but definite improvement followed soon after initiation of this therapy. This serious postopicative complication was cured by penicillin therapy.

#### INFECTED OPERATIVE WOUNDS

Seven patients whose wounds became acute ly infected following surgery were treated with penicillin. The of these were infected wounds before operation and these infections were increased by surgery. Two were clean cases which were infected at operation. Cultures of the dramage from the wounds usually grew several organisms the most constant being Staphylococcus aureus. Parenternl therapy was administered as previously described. When possible local application of penicillin (250 units per cubi centimeter) was made by injection through catheters or by packing the wounds with penicillin saturated gauze.

Six of these wounds responded remarkably to treatment. One wound although infected with pennellin sensitive organisms was un affected. In this case the local edema drain age and healing were not favorally affected by large dosage—20 000 units every 3 hours In addition this pair in twas the only one in this series that manifested sensitivity to peniculin. Torty-eight hours after discontinuance of treatment like developed widespread severe uniteran lasting for weeks.

#### SUMMARY

Lifty patients with infected urgical conditions of abdowen were treated with penicillin as a prophylactic or therapeutic measure.

It is suggested that penicillin sensitive or gani ms so often cultured from these wounds are an important factor in the einfections

l welve rases of patients senously ill with peritonitis all of whom recovered are presented. Further use of this drug as an adjunct in the treatment of this disease is urged. Local administration into the peritoneal cavity apparently has a favorable effect.

Based upon the results in 25 cases further trial of penicilin as a preoperative and post operative measure in the treatment of infected abdominal surgical conditions is suggested

We agree with the suggestion of Fauley and associates that the early administration of penicillin hould prove invaluable in the prophylaxis and treatment of wounds of the addomen. It is stressed that patients should be treated early before wide pread dissemination and localization of infection have occurred.

#### CONCLUSIONS

Staphylococci most strains of which are sensitive to penicilin are a factor in the course of many cases of penicinitis and in postoperative abdominal wound infections

Penicillin is the drug of choice for control ling that part of any infection which is due to staphylococci

The apparent effectiveness of penicillin in certain cases of peritonitis is sufficient to war rant further investigation

Infected abdominal wounds in many in stances can be operated upon earlier and more safely if penicillin is administered as a preop erative measure. It is our opinion that the disability caused by a long continued infection can here as well as elsewhere be reduced by the judicious use of penicillin.

These bservati mad t McClosk y Ge ral Hosp tal T mple T

#### REFERENCES

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### WAR SURGERY OF THE ABDOMEN

### PATRIMES ND FACS Mar MC. AUS Lo s le he tocky

"HE risk from wound of the abdomen in World War II is undoubtedly less than in previous wars but that it is yet considerable can be attested to by all who have had experience with them In an effort to determine the importance of some of the factors influencing the outcome in patients with abdominal injuries a review of our experience in an evacuation he pital during the first year of the Italian cannaisa is presented. During this period we have been located relatively far forward almost always within , to , miles of the front and for approximately one balf of that time were one of the most forward ho pitals For the other half of the period other ho pitals have been in front of us and have usually received the more ecriously injured patients

Our treatment of abdominal injuries has been definitive in character and in most in stances complete Since it is necessary for an evacuation he pital to be ready to receive a rather sudden and relatively large influx of patients we have evacuated patients to gen eral ho pitals for secondary operative procedures such as closure of colostomies and the care of infected wounds. Those patients mak ing most satisfactors recovery have likewise been evocuated to the rear for their continued convalescence. We have been able to hold all our patients until they could be safely trans ported and most of them were well on their way to complete recovery 1 postoperative time interval of 7 to 1 days has usually proved sufficient During occasional periods of great stress evacuation of patients has necessarily been earlier. It is only reasonable to assume that there have been some po t operative incidents and perhaps a few deaths of which we are not co-nizant and which can not be included in the report. It is believed however that the mortality figures are prac tically complete

We have admitted 4" patients with abdominal injuries of sufficient sevents to require the potents. Forts three of these patients

were evacuated to us after their operations in more forward hospitals. There were 3 death in the postoperative group. Three hundred and fifti-en ht patients were received by us for their initial de-mitive treatment and form the ba 1 for the study.

#### PREOPERATIVE CARE

Abdominal injuries are commonly associ ated with a marked degree of shock and it is imperative to improve the patient's general condition before operative procedures an un dertaken. The treatment consists of restoration of the circulating blood volume by the use of blood plasma and whole blood We have a definite preference for whole blood The amount given is determined by the na tient's response \ \ systolic blood pressure stabilized above 100 millimeters of mercury a highly desirable. Not uncommonly three or four thousand cubic centimeters of plasma and blood are required in the more senously injured. These infusions are best given relatitely rapidly and two veins are occasionally chosen to expedite their flow A few hours time may be used to advantage in obta nin the maximum improvement provided the possibility of continued hemotrha c and the hazard of delay in closing intestinal perfor ations are kept in mind and judiciously con sidered For the entire series an average of , hours elapsed between the time of admission and operation. Much of that delay was due to the not uncommon back log of a large num ber of casualties Rarely was it necessary to elect a period of lon er than 3 hours for pre operative treatment

Concomitant with the improvement in the patient's general condition a careful appraisal of the abdominal catastrophe is made. In tretair attertion is paid to the 1 cation. The high of missiles entering, the abdominal from above below from the sudes and tack as well as from the front must always be kept in mird. Likewise the possibility of sulprartial intra

aldominal injuries is indicated by the pres ence of a such cases in this group

When there are penetrating wounds with retained missiles a rocatigenographic study is made as oon as the patient's status war rants. The presence and location of the retained mis the isof great importance in determining whether or not there has actually been peritoneal penetration and the subsequent blanning of the operative procedure.

I xamination of a urine specimen is important in determining the presence of injuries to the urinary tract. Rectal examination frequently by proctoscope has often revealed a previously undiagnosed lower bowel injury

I mptying the stomach by inserting a gas the tube preoperatively has greatly facilitated upper abdominal procedures and diminished the likelihood of aspiration of vomitus

I reparation of the operative field has consisted of shaving and cleansing with soap and vater

#### TIME LAG

In pite of our relatively close proximity to the front the interval between time of injury and admission an average of 11 hours has fre quently been considerably prolonged which can be largely attributed to the difficulty on count red in moving casualties in mountain

us terrain The time lag between injury and the insti tution of surgical care has long been consider tha major factor in the mortality rate and it would cem justly so That time lag is not the mo t ignificant factor however is clearly hown in Table I The extent f the injury and the presence of shock are so much more important factors that the time lag itself i echi sed. It is our impression that infection which is so markedly influenced by the time interval has been greatly himinished as a fac ter in mortality as a result of chemotherapy I ven in the group of cases with perforation of tl ga troint tinal tract in which infecti n mi ht be expect d to be the major factor aft a alt I ng d time interval no such conclu ion

#### ANESTRESIA

nl İrawn fr m our xperunce

I ther has been the anesthetic ag nt of choice. Its administration through an codo-

TABLE I -- INFLUENCE OF TIME INTERVAL BE TWEEN INJURY AND OPERATION ON THE MORTALITY IN 3 7 CASES IN WHICH THE INTERVAL WAS KNOWN

Tim 1		Allcase		Case with holl weise 1 pe f ra 10			
	Case	De h	7 ° 1	Cases	рь	۳ ۲۱	
h m		I			<u> </u>		
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- 5 hours	٠,	1		- 6	8		
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hours	*	ī—		$\overline{}$		ю	
36- h rs	8		$\overline{}$	$\overline{}$		1	
8-7 h rs	8	,	37		,	75	
2~ h rs	,		1	5			

tracheal tube is preferred. The tube affords better control of the respiratory exchange and depth of ane thesia. (perative procedures particularly in the upper laddomen are greatly reclitated. It affords the opportunity for turning of the patient for the care of back and extremity wounds with less difficulty thin when other methods are employed. The like ishood of aspiration of foreign material is reduced to a minimum and the case with which excretions are aspirated from the tracheobron chial tree are most important considerations in the prevention of postoperative pulmonary complications. Voluntoward effects have been observed from its use.

Spinal anesthesia has been used infrequent ty because of present or impending shock and the frequency of operative procedures which required a fonger period of time than the an eithesia would last. Pentothil does not af ford sufficient relaxation of the abdominal musculature for its more general use.

#### MISSILF PRODUCING WOUND

The type of wound and the kind of m: if roducing it have little or no influence on the mortality as is shown by the following figures. Of a total of 358 cases there were 140 with penetrating or perforating wounds and 9 sul parietal woun is Of the 140 penetriting or perforating wounds there were 233 from shell

TABLE II - RELATIVE MORTALITY RATES IN CASES OF INGLE VISCIENT INJURY AS COMPARED TO THOSE CASES OF MULTIPLE VI CERAL INICHIA

-				r.Faran					
Lucus	Only vacua injured			If .5 among oil injury to other success			Total		
	Cares	De de	N D	Cue	Dr tu	1 wind	CM	De h	1
S mach				13					<del></del>
Duoden sm	7	1	1					<del> </del>	
ताभी १० ल	5	6		41	3	-		<del> </del>	- <del>-</del>
tal	1	-		5	-			<del> </del>	; <u>-</u>
pec m	1								
Lave									
Gall blats	]	1	1			5			
Pr									
Jee			-			50			
Lidneys	-								
at di									

fragment with so death or a 1 per cent mortality 75 from bullets with 16 deaths or a 20 per cent mortality 14 from mine frag ments with 3 deaths or a 21 per cent mortal ity 2 from bomb fragments with no deaths a from stab wounds with no deaths and in 18 cases the instrument of injury was not tated In these 18 cases there were 2 deaths an 11 per cent mortality. Of the 9 ubpartetal wounds there were deaths or a mortality of 2 per cent. In all there were 72 deaths or a mortality of 20 per cent

#### INCI ION

The location of the wound and location of the mixtle as determined by roentgenogram are the chief factors in determining the type function to be used. Contrary to a rather ommon belief that missiles may wander about with most unpredictable consequence it has been our experience that they traverse the abdomen in a traight course and istalli the resulting injury may be su pected with a high degree of accuracy. On that a weption the incision i chosen which will at ord the best expo ure and thereby facilitate the operation EXTENT OF VI ERAL INJURY

is shown in Table II the mertality is di rectly proportional to the exte t of asceral injury In 151 cases with a n 1 ascu in

solved there were od aths a mortality rate of 11 per cent. In 10, cases with the or more valcera injured there were 4 deaths a mortal ity of 40 per cent Such a contrast in mortality is shown for each vi cus and is particularly apparent for the upper abdominal vicera It b behaved that the great frequency of multiple visceral injuries in upper abil minal wounds larg h accounts for their relative in creased risk. In speaking of the mortality from pe ific vi ceral injuries it is important to indicate which cases are included. Thu from our experience with 3 patients with wounds of the colon there were 2 d aths a mortality rate of 6 per cent h never in si nationts with a sociated injuresto other nicera there were 2 d ath am reality rate fapper cnt

#### WOLLDS OF THE STONICH

There were one it more perlirations Itl stomach in cases an in if nie of 8 per ent of \$6 case with visieral injuries. In only case wa the st ma h the only viscus injured In 6 ase the sten wa the nical littor I necu injured In a cases the st! nan! ther va cera were in ol el Th remainin, 10 ca 43 are those with a sociated wounds of the liver gall bladder pancreas | n small inte tr and killneys in amous combinati ns

The storach was approached thr u h a left thura ac nots on in a cases al 1 wh h had thoracorbdominal wounds and through an abdominal incision in 13 prients 40 fwhom had thoracoabdominal wounds. Simple closure of the perforations was effected by suturing 1 th catgut and oceas neally reinforcing with interrupted silk. There was no instance of overlooked perforations or postoperative complications from leakage or bleeding.

There were to deaths in this group all of whom had associated injuries to other viscera. In 7 of this group the spleen was injured. All died relatively early following injury and in none was infection a significant fact or

### WOUNDS OF THE DUODENUM

There were 10 cases with perforation of the duodenum an incidence of 4 per cent. All but one of these had associated injuries to other asserts.

Closure of the perforations was accomplished by suturing with catgut and reinforcing with silk or cotton. Extensive mobilization of the duodenum was necess ary, for the exposure and accurate inversion closure of the retro peritoneal perforations. In 2 cases in which this was not done postoperative fistulis developed which were largely reponsible for the deeths. A fistula developed and proved fatal in a third patient whose precarnous condition did not permit adequate carch for and the closure of a perforation.

There were 7 deaths all of which had a sociated injuries to other viscera. Except for the 3 in which fistules developed the duodenal injuries per se did not seem to war rant the usual hopeless prognosis given them

#### WOUNDS OF THE SMALL INTESTINE

There were perforations of the small intestine in 9, cases an incidence of 3 per cent in 44 of these cases there were associated in junes to other viscera. The number of perfor attons virtical from 1 to 30-with an average of 37 per case. The ileum was injured in 46 cases the jejunum in 43 cases and both in 6 case.

Simple closure of the perforations with cat gut was the usual method of treatment. When it was thought that simple closure of multiple perforation in a relatively hort segment of the la wel would result in a mechanical obstruction or prove too time consuming the involved segment was resected and an end to-end anas tomosis was done. I esection was done in 7 cases. In a of these cases a segments were resected and 2 anastomoses were done and in one 3 resections and anastomoses. There were no serious postoperative complications (fis tulas leakage or obstruction) from these pro cedures during the period of our observation From the viewpoint of mortality our exper sence although too limited to be conclusive fails to show the increased risk of resection and anastomosis over simple closure as we have employed them and in spite of the usual greater degree of injury at least to the small intestine in the group having resections

In 1 cases with only the small lowel in solved there were 6 deaths In 44 cases with associated injuries to other visceri there were 18 deaths. The mortality from iteal wounds 13 deaths in 46 cases was somewhat greater than that from jejunal ones (10 d aths in 43 cases) but that fact was of doubtful significance on detailed case study.

#### WOUNDS OF THE COLON

The colon was involved in 83 cases an in endence of 28 per cent. In 51 cases there were associated injuries to the other vicera. In 8 cases two segments of the colon were injured

The procedures employed in the colon cases were more varied than were those for the small intestine Because of the relative im mobility of the colon closure of large perfora tions and resection with primary anastomosis as are used for small bowel injuries are more difficult and time consuming and conse quently more hazardous. Too the colon may be exteriorized with less distressing and dis turbing consequences to the nationt than can the small into tine. The contention of those who hold that all wounds of the colon should be exteriorized because of its poor healing ten dency and the greater than apparent tissue damage from hell fragments is not supported by our experience I rimary suture of per forations in a cases was done without diffi culty arising from lack of their remaining closed The inconvenience of a collistomy the saving in nursing care, the avoidance of prolonged ho pitalization and the avoi lance of

an ther may reperate neverthe a great like hhood of colonic he tuba as in primary closure are obvious advantages. Equally obvious a the advantage of quickly exteriorizing a bodh damaced segment of colon puricular if it blood supply is questionable. The procedure used should be determined chiefly by the extent of the injury.

There were 4 deaths in thi group of 6 cases with exceptions all deaths were in patients having associated injurie to other vicera (4 cases)

#### WOUNDS OF THE RECTUM

The rectum was injured in 6 cases an in cylence of 1 per cent. In 2 cases it vas the only vicus injured in the remaining 14 cases there were associated injuries to other vicera—the bladder in 5 cases the igmoid in 1 cases and the multi intestine in 8 cases in 7 cases the rectum was perforated above the peritoneal reflection.

Sigmoid colostomy and free draina e of the presacral region with excision of the coccur and closure of the perf ration when no it le were done in all patients with perforations below the peritoneal reflection with a single exception. This patient had a large acral wound which it was believed would attord ade quate drainage. Althou h he had fractures of both legs and he general condition was never satisfactory at autopsy it was thought that the madequately drained presacral infection was the chief factor in hi death. In the , cases with perforations above the periton al reflection the perforations were closed and a proximal sigmoid colo tomy was diffe. Three of these patient either had or were su pected as having an additional perforation lower down in the rectum and had presacral drain are from below. In performing the colo tomy it i essential to onstruct a pur and transcet the bowel in order completely to divert the fecal stream Postoperati e cl ansin, of th dutal segment of fe es by means of daily irri eation dimini h s the likelihood of pa arectal infection and also facilitates haling of the rectal wound

All deaths in this gro p with two exception occurred in those patient with a so i ated visceral injurie

#### WIND OF THE LIVER

The liver was injured to o case on in a lence of a per cent of all case has any visceral injune In Sees it was the cole vi it in sured and in the remaining one there win a so rited visceral miuri The extent of the miurs varied from a light penetration with httle hemorrham to exten in licerati ne with ma ive him trhace. In a additional cales in which mall (1 than o cm in diameter) roent enographic tudy revialed mud annarently retained in the liver and in which the re vas no clinical evidence of other viceral injury exploration va n t done. The ear nationts recovered uneventfully. In earcfully selected cases such conservati in seems in ti-

Wound of the hir wire trained routined with a visit, of dry, gauze in a lente certain rette drum which wis brought out through a tab wound usually pixel in the lank. The drain was left in place for 7 or 8 days thin gradually removed. In only 3 or 4 cass was there significant bilant drainage following te moved of the drain. We then deeply winded to me the liver were not he turked. I significant of liver i retemoved. Suturing of lise cention wis not attempted.

In the 3S cases with only the liver injure. I there were 4 deaths whereas in the 3 cases with associated va ceral injuries there were 14 death. Liver wound like th 50 of other sin le vi ceral injuries hav a surprisingly favorable prig mo 1.

#### WOLAN FIRE ALL BLAUDER

The gall bladder was injured in a cases an model ne of i per ent of the baxin, will real injuries. In an additional ask it was a tribos from it hepatic be? I will the vock as otherwise intact an I required no particular treatment, their than suturne back in place. There were a so intal linjure it the abdominal aske a in all case. In fact, the gall bladder injury was considered registering the analysis of the period of

crated that chelicoysteet my wa the price dure of choice

#### WOUNDS OF THE LANCREAS

The princreas was injured in 13 cases an inordine of 2, per cent of all cases with visceral injuries. In only 2 cases was it the only viscus injured 11 having associated injuries to other viscera. In an additional case there was a rupture of a princreatic cyst from a subprinctal injury.

Wounds of the pancers were routinely packed and drained by use of a wick through a Pentose drain brought out through a stab wound. In no case was there drainage of sufficient pancreatic secretion to trritate the skin.

Although too few cases to be conclusive injuries to the pancreas do not appear to war rant the grave prognosis usually given them

#### WOUNDS OF THE SPLEEN

The pleen was injured in 36 cases an ince dence of a per cent of all cases faxing vascral injuries. The severity of the injury varied from slight hecerations or penetrations to extensive hecerations. In like manner the homorrhage from the plenue injury varied from slight to max iv. In 16 cases the pleen was the only viscus injured. In 20 cases there were a sociated viscuel injuries.

Severe injuries to the place with active hemorrhage demand more urgent operative intervention than do wounds to other viscera and when the abdomen is opened care of the bleeding spicen should receive priority over that for other vi ceral wounds. The surgical ap; roach may be either through the che t and diaphragm or from below preferably through a subcostal incision. In 10 cases, all of which had thoracoabdominal wounds the approach was through the chest. In 17 cases 10 of which had thoracoabdominal wound the ap proach was through the abdomen \subcostal inci ion was used in 11 cases a rectus incision in 6 cases. In 21 cases splenectomy was done In 15 cases in which wounds were relatively light and there was no active bleeding at the time of operation the pleen was not removed nervatism in this latter group seems justi fel an laltlough there were 7 deaths all were nttributed to a societed injuries of other viscert and at antops; in no cise was there found cydence of further hemorrhage from the plein. The possibility of secondary hemorrhage in those patients recovering later than our period of observation has been recognized however no instance of such is known to have occurred.

The seriousness of splenic injuries particularly when associated with injuries to other viscera is shown in the fact that in 20 such cases 12 died. The mortality for the entire group was 44 per cent or 16 of a total of 36 cases.

#### WOUNDS OF THE KIDNEYS

He ladneys were injured in 41 cases an incidence of 14 per cent of the group hiving vis ceral injuries. He right kidney was involved in 3 cases the left in 17 cases and in 1 case both were injured. He presence of renal injury was almost always su pected from the location of the wound of entry and the location of the wound of entry and the location of the missile by reentgenogram. The presence of gross hematuria was a frequent inding in this group. The wounds varied from slight contusions ruptures and penetrations to extensive licerations. There were as sociated injuries to other abdominal viscera in 29 cases only 12 patients having injury to the kidneys alone.

The traumatized kidney in our experience is best exposed through a subcostal incision. This incision was used in 16 cases a rectus in cision in 16 cases a flank incision in 6 cases and a transfloractic approach in 3 cases.

In 16 cases the injury was sufficiently extensive in the opinion of the urgeon to war rant nephrectom. In the remaining 2,0 cases more conservative procedures such as a gauze pack, or drain in 16 cases renal suture in 4 cases and rephrostomy in 1 case were used in 4 cases the injury was found to be of such slight degre as to require no particular treat ment. In no patient having these conservative procedures was there significant post operative renal hemorrha or infection whilunder our observation.

There were 17 deaths in this group of 41 cases a riortality rate of 41 per cent. In the 12 cases with only renal trauma there were deaths neither of which was attributed to the

renal injury per se. There were 5 death in the patients not uby the lite net heretomy. This is doubtful semitanta, how were mee they had extensive a sociated vie eral injurie. The fact that a less severely injured kidnes, can be saved without undeen k of subsequent morbidity is ufficient justification for conservation whenever possible.

#### WOUNDS OF THE BLADDER

The bladd r was injured in 15 cases an in citizenee of 5 per cent of the group has mg viceril injuries. In cases the bladder only was involved in 4 cases the rectum was injured in 4 cases the small intestine was injured and in 2 cases the small intestine and rectum were the sites of associated injuries.

Suture of the bladder perforation with a suprapuloic cystostomy and a drain to the pace of Retzius was the routine employed

There were deaths in thi group One death was a result of hoch following a large shell fragment wound throw h the sacrum rectum and bladder and in pite of massive infusions of whole blood and plasms. The other death was the result of an a sociated perfortion in the small inte the which was not discovered at operation.

#### WOUND OF THE URETERS

Of the 86 cases with visceral injuries only in one was there a severed urcter. This pa tient had a gunshot wound perforating he if ft thigh pelvi and ri ht buttock. There w re compound communuted fractures of the left femur and multiple fractures of the pel as At operation he was found to have a perforation of the dutal deum the base of the bladder was extensively lacerated and the right ureter was severed about 4 centimeters above the ureterovesical junctur The preter was reimplanted into the bidd r Closic of the lacerated bladder was incomplete and a drain was in serted down to it A suprapala to toms was done Except for some urmary draina from the bladder wound he in alescen e wa Lr ventful

#### THE PEAC ALDOMINAL W UNDS

The were wittin wind of the thorax and abdomen in 10, case. These wind

were caused by a sind mid will perform to not the draphra min 36 c.c. In the oth reases the thoracion label mid also condwere caused by sparate mid.

In the treatment of these case of ned ration of the che twound has received printic particularly if there was respirator difficulty. Once that difficulty was relieved and the can eral tatu of the patient permitted the ab-

dominal injury was cared for The choice of operative approach to the aldominal injury is a point about which the reis much controversy but in our experience of

doubtful importance

There were 31 death in thi group of 10, cases of the deaths occurring in pittings who failed to urrive long enough for their surgery to be und riaken. Uthough the mor lathy rate for cases with thorseorbdominal wound usel htly greater than that for theen tire series it in not remarkably different from wound must are the upper addormals is cera with which the compari on should ik made.

This it may be a nelu led from an experience that the racouldominal wound carry about the same prognost a those involving the upper abdomin a ki no once the re-pirators of substrainance in present is rich at 1 his choic of operative a j roach has no appar in significant relation hip to the mortality.

#### NO VISCERAL INJULIES

The abdom n was explored with ut findin similiant injury to a vi cu in 64 cases. Thi group undoubtedly would have fared better with ut lapar stomy and in our lesire not to err on the other ade which did not occur per hans a few were subjected to operation with out sufficient ju tilicati n. In 20 case A retroperatone I hematoma was found at opera tion whi h gave rise t abd minal tendernes and some degree of mu cular pasm 3 hich in addition to a pen tratin a und usually of the back mai laparet my seem ad usable In 1 Care wil rate n of the abdomen w 5 done be ause it rient on graphic evidence of a fore n lody west ated that we could not be erran bether or net it had pen trate! the pertineum. The number would be or a therably larger were it is a for our policy of

TABLE III -- FYPERIFYCE WITH CHEMOTHERAPA IN 43 CASES WITH PERITONEAL LINITRATION OF WHICH 157 CASLS HAD HOLLOW VISCERAL PERFORATION

p	P 1	All	Dr h	Case with hillower cersi peri	D h	De b f m t na	De h f m p i pe tom
Su fenamid	Loc 11 nous d ral	69		,			
Monamides	In venou dor 1			6			
Stantamd and pe II	Lor 11 muscu!	60		5	•	3	
P 178	Loc 1 dl m scul		5	·	5		
PID	1 m = 1	5			8		
	T			5			7
				1		1	1

debriding and exploring such questionable wounds primarily. In many in tances the mi sile has been found extraperitoneally obviat ing the necessity for laparotomy. In 14 ca es with penetrating wounds of the anterior ab dominal wall and mu cular rigidity the peritoneum had not been penetrated. In 6 cases with penetrating chest wound and marked n white of the abdomen in which the mis ile was found on roentgenogram to be situated questionably just above or below the dia phragm and in perforating chest wound in which the missile may have als perferated the dry bragm the abdomen was explored an I found negative. The frequency of finding also dominal rigidity associated with curely chit wounds was con iderable and the e 6 mi takes vere mad in pite of our cognizance of the fact. In , cases there was massive de tructi n of the aldeminal wall from large shell fr & ment but the peritoneum at Inparotomy was f und into t One of the e cases developed a fulminating clostridial infection in a large flint a und which proved fatal. The only etl r fatality was the result of a players fr m a prated vomitus before recovery from ane th in CHEMOTHER APA

Here can be little doubt that clem thera It I as played a significant rôle in the low in cid nee of peritoneal infection fellowin al d miral injuries. Talle III hoss our exper ience with ch moth rapy in 4 cases with pr ved peritoneal penetrati n or vitl perf r att n cf tl e inte tine from ubpari tal injurs

In 11 patients receiving ulfonami les there were 3 deaths attributed to presentable per

In 131 patients receiving penicillin there were 4 deaths attributed to prevent able peritonitis

Of the 5 other patients dying from periton itis 3 had diffuse suppurative peritonitis at time of operation one had an overlooked per

TABLE IV -ANALYSIS OF DEATHS

C in tan b | Com |

C or fdesh	Care	K m 1
hoak	36	S de hoccu red h p en rai ve i mon i k h i h h i h h i h h i h i h i h i h
		John bad off we frail pe on m ion As look dipet we led pe beve hele we tand it on modera pe we tand it it wup Average un hage b gr puty to fin on hou in n n pera h
Pel omri		fos 1 bro h peumo 1 - s- abl bas 4 3 asc
Peix F 1	-	Arh fornap im lase Aph im log case Convuls r lbc anvites us sea.  d veloped fi las los px l sa of disidenal pe sa pa im developed fis l im ove losted di chealif so
Ass med screens		Ceret 11 my ope red he m for lact here de ha
A		A rea foll ny meas ve ra sior both ase
E ne )		Inader d d press 1 ar et so to pa klak so 1 lei lion over souted for so lei lion pa se k l'm na ag los stalf k et so pa se son pa hor pe or austru
att no erm sel		ases had he opened be an inal syndrome or hise ered spoul cord him hing he found to are lost deal.
Tot 1		

foration and one never recovered from profound hoc! It we felt that there 3 cases could not reasonably be charged again the efficacy of chemotherapy. The desages of the drugs used were ulfandamide powder 3 to 10 grams locally sodium ulfadazine grams each day infravenously sulfadazine grams four times daily orally penicilin units 30 000 locally and penicilin units 20 000 every 3 hours intramu cularly. They were given for a peniod of a week or 10 days or until the dan ger from peritoneal infection as determined from clinical progres is had passed

### POSTOPERATIVE CARE

Careful attention to the details of post operative care is of the utmost importance to the severely wounded patient. Since most of these patients have been in some degree of shock preoperatively and replenishment of the circulating blood volume has been started on admission to the shock ward it has been our practice to continue the infusions during the operation and postoperatively until the hem atocrit and hemoglobin determinations an proach normal. The gastric tube inverted preoperatively is connected to a Wangensteen apparatus and suction is maintained until effective peristalsis is e tablished fluids plasma and vitamins are given until liquids are tolerated by mouth Chemother any has been used as de cribed. Particular alertness to the development of pulmonary complications is necessary Encoura ing couching turning of the patient frequently and occasional tracteal a piration as well as bronchoscopic a piration undoubtedly liave prevented many serious complications. In nite of chemotherapy infection of the operative and missile wounds has been a common occurrence and an occa ional intra abdominal abscess has developed Early detection and the prompt institution of drain me of these infections are mo t important. Drains and utures are u ually removed prior to e acua tion of the patient. Whenever retertion su

tures are used however they are frequentle left in place until the pate in arrival at the base. There have been three wound do ruptions in this group while under our observation which required secondary of the

#### ANALYSIS OF DEATHS

As shown in Table II exactly in half of the deaths were attributed to shock. Many of those attributed to other cruses had u ha degree of shock and their re istance va so di minished as to preclude their rec viry from relatively minor disturbances. It is our impression that the term shock inalequately expresses the true condition, because the status of the circulation as determined from the blood pressure and pulse rate may seem ade quate but the diminished vitility from extensive wound with some relatively minor complication will result in a fatality 11 e final diagnosis died of wound is it lably as accurate as any in the present tite of our knowledge

#### SUMMARN

1 A review of 328 patients vith all lominal injury admitted to an evacuation hypital during the first year of the Italian compaign has been presented

The extent of the intra al lominal in jury is the most important factor relative to the mortality. Time lag before operation type of missile, and principal vicus involved except for plenic injuries are, we hadowed by in and procar relatively insignif.

Shock was directly r spon if he for half of the daths and was at least a see adary factor in many of the others. The in-pixed of giving large amounts of blood and plasma over an a crage preoperative period of theurs.

4 Infection peritoneal retroperitoneal and pulmonary was responsible for about one fou thof the deaths. It is beliesed that chemother by has favorally influenced this factor.

The sulfonamides an I pent illin appear about equally effective in the p evention and treatment of personati

### GUNSHOL WOUNDS OF THE SPINE

## Observations from an I vacuation Hospital

## IAMES L. 100L MD Mar MC AUS New York New Y &

URING the years 1943 1944 \$7 pa tents with gunshot wounds of the spine were admitted to an evacua tion hospital while on active service. The following report deals primarily with the surgical management in the 35 cases (61.4 per cunt) in which laminactomy was done.

Of the 33 laminectomies 3 were cervical 16 thoracie 14 lumbar and 2 sacral. The neuro lo real status showed appreciable postopera tive improvement in 0 eases (37 per cent). Of these 0 1 were lumbar wound 3 thoracie.

acral and a cervical Fleven patients (31.4 jur cent) howed no po toperative improve ment There were 4 postoperative deaths in ho jutal giving an operative mortality rate of 11 4 per cent The highest mortality occurred in the coinbined chest pine wounds (2 fatal ities of 6 such eases) The highest incidence of neurolo ical improvement was noted in the lumbar cauda equinal group (c of 14 cases) The dura mater was intact in 4 eases and lacerated in 11 One pinal cord absecs was encountered and of 2 cases in which a sizable shell fragment was removed from the ub stance of the pinal cord one showed no post operative progress while the other heard dramatic neurological improvement. Len ja tients were considered to be suffering from it reparable pinal cord contusion. The pinal cord k sions due to accidental rather than gun shot wounds are not included in this series

I hey Experience with pinal injuries due to gunshot wounds has demonstrated the first that the clinical findings lumbur juncture, and x ray studies (even though text c. 11) do not always give a true c turnate cith intra-limit path of gi nor of the pr gno tie pr baldit. For these rea on each patient hould be given the benefit j fa mue tomy dramiture ru tits having been oft irelivit in the hope for such had be n entertained to paragraph evolute its construction.

rated upon 4 weeks after being wounded at which time a thick epidural cuff of fibrous tissue with incorporated bone chips was removed from the level of the 9th thorace vitebra. Neurological improvement began the first day after operation and continued until the patient began to wilk 3 weeks later.

On the principle therefore that there is everything to gain and little to lose in this class of war wounds laminectomy is encour

nged

#### INDICATIONS FOR LAMINECTOMY

The three eardinal indications for laminic tomy in compound fractures of the spine are for (i) relief of root pain (2) closure of lacer ated dura (potential avenue for intrathecal in fection) (3) decompression of the cord or cau da equina (probably the least urgent of the three)

t Relief of root pain is important in two counts. In the thoracic level it may seriou by retard respiratory excursions of the chest wall and di courage coughing—which i essential for adequate expulsion of intratrachal mucus in the lumbar level intense prolonged ro t pain may throu herflex cardiorespiratory ar rest or shock cause death.

In support of the last statement a case may be cited (unfortunately not seen by a neuro surg on) in which autopy revealed a large cluster of ragged be ne chip entangled among the roots of the cauda equina following, and he two und at the d lumbar vertebra. De pite hearly sedation and morphine this patients suffered almost unremitting agontaing print in both leg causing him to scream ale under the last of the injury of the injury of the last of the injury of the last of the injury of the last of the injury of the last of the injury of the last of the injury of the last of the injury of the last of the last of the injury of the last of

shock occasioned by the acute pain an l trau matte stunulation of the affecte l nerve roots I our of 5 patients having imilar severe root pain were operated upon with immediate posteperative rules. The condition of the 5th

and was believed to be the result of reflex

foration and or never recovered from priound hock. It was felt that these executed not reasonably be charged arainst the efficacy of chemotherapy. The dosages of the drugs used were sulfanilamide powder 3 to rograms locally sodium ulfadazzine grams 1 court times daily or-lly pensellin units, 9 coo cleally and pencillin units, 5 coo every 3 hours intramic cularly. They were given for a period of a week or 10 days or until the dan ger from peritoneal infection as determined from clinical progress had passed

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tures are used however they are for points left in place until the patient arrival at the base. There have been three yound diraptions in this group while und rour of servation which required secondary of the

#### ANALYSIS OF DEATH

As shown in Table IV exactly one half of the deaths were attributed to shock. Mary of those attributed to other causes had such a degree of shock and their re istance 1 15 so di minished as to preclude their receivity from relatively minor di turbances. It i our im pres ion that the term shock inadequately expresses the true condition because the sta tus of the circulation as determine I from the blood pressure and pulse rate may seem a! quate but the diminished vitality from extensive wounds with ome relatively minor complication will result in a fatality 11 e final diagnosis died of wound i it lably as accurate as any in the present state of our knowledge

#### SUMMARY

1 A review of 3.58 patients with all dominal injury admitted to an evacuation 1 spital during the first year of the Italian campu n has been presented

The extent of the intra aldominal in jury is the most important factor relative to the mortality. Time hag before peration type of mi sile and principal vi cus in Ned except for spleme injuries are overshadowed by it and appear relatively insi infloant.

3 Shock was directly re ponsible for half of the deaths and was at least a scendary factor in many of the others. This in pite of giving large amounts of blood an I plasma over an a crase preoperative period of a hours.

4 Infection peritoneal retroperitoneal and pulmonary was responsible for about one f urth of the deaths. It is belt ved that chemo therapy has favorably influenced this factor

The sulfonamides and penicillin appear about equally effective in the previntion ar! treatment of peritoniti along the course of each metatareal usually resulted in low vermeuth response of that toe more widspread sweeping Jantar stim ulation would evoke a similar re ponse in eqreal or all the toes of that foot \(^1\) in apprecia able delay was noted between the time of plan art stimulation and the evoked toe re-ponsewhich seemed definitely reflex rather than mechanical in character. Abdominal reflexes were not obtained in thise patients. The levels of unequivocable cord transection in these cases were at the 2d cervical 2d 4th 6th and

7th thoracic vertebrae

delayed vermicular plantar toe re flex demonstrable in patients having a complete cord lesion would seem to be at variance with the commonly accepted views on cord physiology which teach that the initial find ings are total areflexia below the affected lex el due to spinal cord shock Another ex ception to this rule was the patient having total ensory and motor paralysi below a cord ab cess at the 7th thoracic vertebra who was ubject to frequent pontaneous painle s con tractions of thighs and legs not unlike the ma s withdrawal reflex seen in long stand ing cales of cord transection. Yet in this in tance these contractions were apparent dur ing the first 20 days after miury. It is he ped that other observers will seek for similar sign in similar cases so that a pr per explanation an i evaluation may be arrived at neuro surgeon has already mentioned (per onal communication) seeing these meter re ponses in some of his early cord cases

#### COMPLICATIONS ASSOCIATED WITH SPINAL INJURIES

Clet complications. Hamopheum the reveal and julmonary contusion have been as sociated other uninterally or biliterally with 6 of the 16 thoracce piral wound ubjected to hame ctomy. Lour of the 6 patients had a stormy posteperative course even though the variety let be estifact type nearly on the variety let be estifact type nearly on the july medium of the latter even the latter of the latt

ral catheters oxygen transfusions nasopha ryngual and intratracheal suction etc. I wo of the 6 cx is proved fatal

Some of the presumed alterations in phy siology encountered in this type of case in clude (1) incomplete expansion of the lungs due to residual hemopneumothorax or pul monary contusion (2) curtailed oxygenation due to re piratory embarrassment occasioned by paralysis of the intercostal and abdominal musculature (3) faulty expulsion of mucus be cause of difficulty in coughing owing primar ily to mability to fix the thoracic cage and abdominal muscle as a preliminary to the act of coughing (4) tendency to postoperative pul monary congestion on these accounts (5) pos sible reduction of normal systemic blood pres sure response similar to that sometimes ecu after spinal anesthesia due to the flaceidity of the paralyzed half of the body

I recautionary preoperative measures might well include the following (1) Allow ample time for fullest po sible stabilization of the cardiore piratory 3 stem before laminectomy (2) Encourage deep breathing and coughing on regular schedule (3) I nsure adequate blood volume red blood cell count and hemo globin values (4) I esort to a scrupulous and if need be h rose use of masophary ngeal and intratraclical catheter suction or when indicated broncho copy All of these latter mea sures have been used vith obvious benefit and success thanks to help from the chest pecial (5) Epledring preoperatively may serve to counteract a tend ney to hypotension oc ca infed by flaccid paraly is

16dominal complications Intra abdominal lemorrhage perforation of bowel or lacera tion of lidny are urgent indications for operation that should precede laminectomy

Of the 14 compound comminated fractures of the lumb ar pine 6 required major surgery after than laminecterny 4 nephrectomies 1 lump, explorit in 1 laparotomy. Four of the 6 w ne improve latter luminectomy 1 showed no mij rovenent and 11 n. was r death due to pulmonary, and lu

#### OH RATIVE TECHNIQUE

Lattle need be added to the extensive literature on the ul ject of operative technique It is suggested however that normal dura be exposed above and below the ite of injury so that dissection can be carried thence up to the actual point of traurna with least hazard to cord and nerve roots. It is usually safer to avoid opening the dura in potentially infected wounds unless there is an evident block or underlying hematoma. When the dura is lacerated it should be opened widely so as to en sure removal of all bone and metal fragments clots or clothing that may be driven into the pinal canal Nerve roots that are completely torn should be cleanly trummed and their cut ends secured if necessary with silver clips This procedure effectively alleviates postope rative root pain. It is probably best to avoid using the electrocautery in close proximity to ord or roots lest its disseminated heat fur

ord or roots lest its disseminated heat fur ther damage these structures. The dura should always be closed as it is evident that the incidence of meningitis is thereby appreciably cut down. Dural repair may be accomplished by direct suture or by a fascial dural or fibrin film patch. In the closing of a badly contaminated wound it; best to leave the

kin un utured and approximate only the deep er mu cle layers. When exten the loss of the makes muscle closure impossible it seems best to close the skin and to leave a drain in the wound for a to 48 hours. Contact of sulfa drugs with the spinal cord had probably best be avoided. Diluted pencillin hower in has proved harmle's and effective when troduc d intrathically and has been frequent by used in this senies.

Spinal fu ion has been re-orted to on only i occasion. In this prisoner of war a machin gun bullet had penetrated the back cuttm acro s part of the cauda equina at the 1st lum har vertehra then lodging firmly within th body of that vertebra The wound was gro by clean the de truction of the vertebral body con iderable so that it seemed both safe and expedient to pa k clean bone chip (from the adjacent pin u processe) firmly into the wound flood viti penicilin sclution and close tightly. The patient made an one of ful recovery showing surp isingly prompt and ranil neurolo ical impro errent so that it was felt that he would vertually be able to walk nd void reasonably well Roent en

ograms taken 2 weeks after operation showed no signs of osteomyelitis

Postoperati e care The usual measure should be taken including frequent turning the aspiration of mucus as indicated and sal fadiazine or penicillin or both as preventative chemotherapy. The leg should be el vated when the patient 1 parapleme (1) to avoid overstretching of muscles ( ) to avert undue venous stasis and the risk of consequent throm bophlebitis Active and passive exercise should be encouraged and an ambulator, pa tient a smed to this task in busy ho pital Suprapubic cystotomy has proved desembly in all patients having partial or total blad ler paralysi. When these patients are tran f r red to a general hospital tidal draina ınstıtuted

#### COMMON CORD LESIONS

The common cord lesions seen in this series include the following spinal cord concus ion contusion crushing laceration hematomyel is and mechanical phissiological block. Combinations of some of these condition have been observed in several cases, sometime leading to difficulty in establishing a correct class in teation.

Concussion Sign and symptom of par tial or complete cord disfunction at the livel of injury which as a rule begin to clear away within a few hours at m t f llowin injury and clear completely by the end of a to days The condition a qually the realt of an impact lire ted a ain tax riebra whenc the force 1 tran mitte I to the cor 1 The mi ile may home r pa l w t the spinal ca nal without touchin a v riel ra more fren it pases through rit jart of a vartel m or ricochet off it. Thu there may or may n t be an a so rated fractur Generally ther i no dural penetration though the dura may be truck or gra e I to the offen lin mi sile or a detached ben chij ( neu n of the cord re bable er at temperes d turtanc of neuro at of 1 1 1 1 1 1 1 n tarrin (creterate ) of the storla in

Cont 5 n C fl 17ms and symptoms f per isten u utally undi ate m re lasting if n t perman nt cord damage due t direct physical rather than physiological cell trau ma or associated a chemic and hemorrhage, changes or both. The injury is essentially the same as that described for concu sion but more drastic. A contu ed cord may be soft much an addemations at the site of injury and may or may not look swolkin or hemorrhagic depending on the type and severity of the injury.

(rushing lacerating or hemorrhams (hem atomyolia) cord lesions may simulate con custion or contituon from the chinical tand point but can usually be readily recognized on direct inspection at operation or autopsy.

threes. Abscess of the midthoracic cord was encountered only once in this series. Lam. mectomy was done for a total cord lesion at the level of the ,th thoracic vertebra. There was partial spinal fluid block vanthochromic fluid and 4 plus protein. The patient had been wounded 20 days prior to operation by a bullet that perforated the right pleural cavity before fracturing the 7th thoracic neural arch Here were no clinical or cerebro pinal flui l igns of meningitis. At operation the cord at the level of injury appeared softened partly cystic and unusually might throughout its entire diameter for a longitudinal di tance of 1 , centimeters Culture grew staphyl coccus numerous micrococci and gamma stres tococci Penicillin was placed in the wound ixfore the dura vas completely closed The patient recovered with no change in neurological tatus and without menin its

#### MORTALITA

In the 3 operative case reported there were 4 deaths in fatalities 1 attents had be 1 ns of the thoracie pine, and 2 of these, had associated the 1 wound. The causes of death

i Iulmonry embolus c endary to throm be phi but of if femoral vein Lamnectomy was performed for severe compound communuted fracture of i lumbar vertel ra with laceration of me to fith new ret it the level ir bably due to la k i vat right he rail ed ure the patient alse i vi lpel transent in might (culture rote) ret ly while it was no longer climethly if year at min of tath in riws there eviden the ref at the light of the rote of the r

been receiving sulfadiazine by mouth and penicillin (intramuseular and intrathecal ad ministration)

2 Hemopheumothorax persistent de pite indwelling mitrapleural eatheter and frequent thoracinteses Lamineetoms was done at the 6th thoracic vertebra Contu ion of cord was complite at autopsy (Dura not opened at operation)

3 Hemothorax left moderate atelectas bidateral hemoperatoneum—1200 cubic centimeters of fresh blood from punctured right diaphragmatic artery during la thoracentes; e-evidently the precipitating cause of death Laminectomy was done at the 3th thoracic vertebra. Ma sive hematomycha of cord was found at autop y

4 Brain abscess left frontal secondary to postoperative acute pansinusitis Death occurred despite decompres ion of abscess and shuwes. Laminectomy was done at the 1st thoracie with 1ra

thoracic vertel ra

It is a propose to mention here that since pinal lessons may make pathology in anesthetic and of the body unusual care must be ever at ed. in warching, for such conditions as thrombophic bit in the legs intra abdominal homorphage etc.

lor purpo is of comparison all patients having guishot wounds of the spine admitted to this hospital during the years 404 1044 have been summarized that is the patients who would have had laminectomy by I their condition permitted or warranted and the 35 patients just reported who did have laminectomy.

This summary indicates that of the total of patients nearly two third could be given the benefit of a laminectom. 4 pritients r 44 per cent had major associated wound meningits occurred in 5 patients not operated upon having dured penetration (and of these preved fatal) while only i transent case occurred in the group operated upon 1 if it seems preved fatal) while only it frament case of coursed in the group operated upon 1 if it seems prevent and the group operated upon 1 if it seems prevent in the group operated upon howed marked in unological improvium in after lamine termy again 14 2 per cent point taneous improviment in the series not operated upon 1 up

It is also apparent that the incidence of menuncitis is highest in the patients having lumbar pine wound Finally though the operative group 1 obviou is a selected one the best all around results are apparent in it

#### SUMMARY

- 1 All patients with spinal wounds who were admitted to an active Arm. Exacuation Hos pital during the years 1943 1944 due to gun hot wound (battle ca ualties) and having evidence of involvement of the pinal cord or root are reported
- 2 Of a total of 3, patients 35 or 614 per cent were ubjected to laminectomy & to mortality rate neurological improvement and low incidence of meningitis this group

had by far the lri hter record a compan i

- 3 The following concepts are discussed (a) advisability of laminectomy whenever in licated (b) indications for laminectomy (for relief of pain for dural closure for d compression of cord or cauda) (c) advisability of d laying laminectomy in the presence of a sociated che t wound and of early laminectomy in cauda equina le ions
- 4 1 plantar vermicular reflex i de scribed that may prove of value in estimatin
- the extent of cord lesion

  s Spinal cord concussion contusion and other injuries are di cussed

# RISFCTION OF THE LUNC IN PULMONARY SUPPURATIVE DISEASES

## Factors Contributing to Its Progress

I FITTIF M CARLTON Jr MD ad W F ADAMS MD FACS Che go Ill nos

AIID advancement in the treat ment of nontuberculous suppura tive disease of the lung by surgical resection of the involved part has been made during the past decade. This progre s has been gradual over that period and has been due to a number of factors \mong the most important of these have been the proper preparation of the patient for opera tion improvement in anesthetic management and operative technique, and a better knowl edge of the postoperative requirements including chemotherapy. In view of the continued advancement in this field of surgery a report of our experience was thought to be justified

This study I based on experience with 5) patients observed mainly during the past 5 years and consists of 45 operations on 36 patients for primary bronchicetasis 9 cases of bronchicetasis secondary to bronchial tumors and tuberrulo is 7 cases of infected cytic disease of the lung and 7 cases of chronic non pecific pulmonary suppuration

#### PREOFERATIVE PREPARATION

Patients with chronic infection of the lung should be ho pitalized for a minimum of 3 or 4 days for observation and laborators examinations before operation. Our patients receive the routine laboratory study viz llood inne vital capacity putum culturand examination for acid fast bearill. If ancinia and hypoproteinems are present its a corrected by tran fusions of whole local Stereo copic roctigenorams of the chest are made before and after bronchio graph. Bronchegraph usually 15 the a juriatory method is carried out under hosting the provided of the control of the provided of the pro

fluoroscopic control and all lobes are filled and not films are made. Each patient i bronchoscoped This enables one to rule out the presence of a foreign body new growth or bronchostenosis. It permits one to ob serve which bronch are discharging ous and the relative amount from each bronchu I encated bronchoscopic a piration once or twice a week preceding surgery is indicated in severe cases in addition to daily postural dramage. On the day of operation postural drainage is maintained for 10 to 15 minutes an hour before going to surgers. An ear nose and throat pecialist cheeks each patient for sinusitis and institutes treatment when necessary Before surgery all patients are started on sulfadiazine or allied drugs and the older age groups are digitalized

#### OPERATION.

Inesthesia The anesthesia for these open atons a well as for all intrathorae surgery should facilitate good exposure and provid ad quate oxygention and support to respirition. It should necessitate minimal motion of the lungs and produce the least interference with cardiore paratory function as well as minimize postoperative complications. We lave found ethylene plus oxygen plus ether 1 liministered through a singular form k, with a Wekesson machine to be the most satisfactory anesthesia for these operations.

The patients are placed in the Trin delchiburg position of 20 to 30 degrees with the operative site upward. This facilitate drainage by gravity of mucopus into the fearnast, during urgery. When this is acc in phed very little difficultly due to re-pirat ry obstruction has been encountered. Bird is not Crahim (3) have urge ted that in Crahim (3) have urge ted that in bulateral be included in the placet.

in a smarting position while the first type is being performed. The secretions from the lun, its we being remove I would then gravatation to the dependent infected lobe of the hopposite idensical of into the trachea and thus minimize the danger of inflocation during the operation. We have not found the use of intratracheal anesthe in to be of any read advantage in removing bronchal screetions and thu have avoided the occasional operative and postoperative complications reported with that method.

Operati e tecl mane Adequate expo ure 1 essential and for lower lobectomy is usually obtain d by the resection of a long segment of the th rib For pneumonectoms or upper lobectomy resection of the 5th or 6th rib is preferable. The phrenic nerve is then crushed This decreases the motion of the diaphragm facilitates the technical procedures and aids in the rapid obliteration of the remaining pace following re-ection. Whereas in the earlier part of our experi nce the tourniquet technique and closure of the bronchial stump with matter's sutures was employed during the past years the disection technique with individual limation of ve wils as worked out and described by Blad's and Kent (4) has been the procedure of choice in the majority of This technique is now used even in case in which the fi-sure is incompl to or in which marked infiltration about the hilum is present. This has been one of the major factors in the reduction of complications and morbidity of lung resection for suppurative disease. In the dissection technique the ve sels are mobilized an I doubly ligated with linen If they are of a large caliber and short the di tal ligature is a tran fixion suture. Be fore division of the bronchus laparotomy pads are placed about this region to minimiz contamination (lo ure of the bronchial stump formerly was accomplished by two rows of utures the proximal ore being mattress in type More recently cloure ha been made with a in le row of double to o chromi catout utures and far fewer po toperative b onchial fistulas hav empvema G ulted I mor to the placing of uture the bronchial secretion are removed with a dry

swab followin which the mu osa i de

stroyed Iv cauterwit it with a let consolution of liver nitrate. Since the tech nique has been employed no Ironch [1 transitions and only empresses have occurred in experimental and pneumonectomy. When the dissective technique is used care must be extraced a ligating the artery and closing the brock for the blood supply and air pactice to the blood supply and air pactice to adjacent remaining lung may eatly be in paired as pointed out by Blades and kert (4) and Churchill (1).

Mer the I ronchial stump is closed grams of ulfathiazole is prinkled about the bronchial stump and pleural cause \ No 6 I ezzar catheter is brought out through a stab wound in an intercostal pace poster laterally for continuous suction drainage f the pleural cavity (In pneumonectoms sulfonamides are not used locally and the pleural cavity a not drained ) All area of atelectasis in the remaining lung tis ue an reserated by slightly increasing the positive pressure and massa ing the lung The chest wall is then closed with two paricostal sutures of a double strand of chromic of catgut. The intercostal structures are at proximated with chromic to co cated We have not of erred persistent severe p. 1 following the use of paricostal suture as have some authors. The pleural pace is that a pirated by means of a pneumoth ra apparatus until a negative pressure of approximately o to 10 centimeters of wat f obtained We feel that the re-expansion of the lung in this fashion is le sapt to prod ? po toperative pneumonitis and intribul emphysema than if inflated by the use of high intratracheal pressure

Immediately following surgery the patients are bronchoscoped if there is a question of accumulation of secretions in tracheobronchial tree

Reflacement the apy. There is no distinct that fluid and bloof replac ment their plays a may r role in the lowered moth and in stality as centred with lung recent White and Buxton (18) have boon too to occ cubic centimeters of blood a lost during a lobectomy and an average 1 occ ubic centimeters fluing a pneum of the centimeters of the stall of the centimeters of the stall of the

tomy Therefore our patients undergoing lobectomy and pneumonectomy received room of 1,500 cubic centimeters of whole blood during surgery. In this way a nemia hypo proteinemia and shock are obviated. It is much more de irable to prevent hock than to wait for its occurrence be lore treatment is instituted. Infections complicating the operation should be less frequent if a normal state of the blood including plasma protein level is maintained. (6) Wound healing is also favored (17).

#### POSTOPERATIVE CARE

The four most important factors in the postoperative care are (1) avoidance of anoxia (2) maintenance of a clear bronchial time (3) early expansion of the remaining lung on the operative side and (4) control of infection

Inoxia Oropharyngeal insufflation of oxy gen is started immediately after surgery and is continued for at least the first 4 hours It is known that after pulmonary resection fhere is often a mild degree of anoxemia that may last for several days even in the absence of serious postoperative complications. Maicr and Cournand (13) lave shown that there may be a more prolonged and severe degree of mora after uncomplicated lobectomy than after pneumonectomy. They explain this by the fact that the remaining lung on the side operated upon agentes poorly immediately following surgery while the circulation is not reduced in proporti n Thus the difference between cir plation and neration accounts f r madequate oveg na tion of the flood having the remaining lun tis ue on the sid of operation Main tenance of a normal status if the blood by replacement of blood to s during surgery is of primary importance in the prevents n of anovia

Scretions It is imperative that the track cobrond had tree by as free as f well feet in he must like bag, intaines an will class an Ipricum into Issafra A state. I alt ints are fronchio ope If Illewing ung in little in any question of in reased Ironchius secretions. As soon as cincionnesses is regained the lead of the bed is elevated 4 to

7, degrees and the patient is urged to cough and move about in bed in order to clear the air passages. Catheter suction of the naso pharynx and traches is employed at the sightet i indication of secretions in the tracheobronchial tree. This not only removes secretions readily, but stimulates a more effective cough for clearing the air passages. If the tracheobronchial secretions are removed thoroughly, following surgery, the tendency for further secretions to divelop is dicrea ed. If cough or catheter suction is insufficient to remove the secretions the patient should be bronchoscopied immediately.

Expansion of the lung By means of con stant pleural suction (1) and maintenance of a clear tracheobronchial tree we strive to overexpand the remaining lung tissue and completely obliterate the pleural space as rapidly as possible. This usually requires 12 to 4 hours I arly overexpansion of the remaining lung and obliteration of the pace reduces the incidence of serious pleural in fections and postoperative morbidity expansion of the remaining lung tissue fails an empyema may be expected. The drainage catheter should be large enough to remove the ol ural fluid and air as the remaining lung tissue fills the hemithorax. If loculation of the pleural fluid occur thoracente is is immediately ja rformed A fluoroscopic exami nation is made within the first 1 to 4 hours to evaluate the status of the chest and is repeated frequently thereafter during the entire period of hospitalization

Injection. The prevention and control of miction have fact major problems. However fue to the many advances it improved its use if the bronchus early expansion of ite lung muntenance of a clear tracheo is rachial free and the use of chemotherapy (ulfonnucks or pencillum) the medience of seri us infections has been greath reduced. Ill patients now recive ulfa drugs or panillum before and following operation. They have for keeping of the fittle doubt but that the use of these lung, is of definite value, when or milined with improved operative procedures.

Due to the lack of an ad quate upply of penicillin for civilian usage this agent has

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TABLE I -TREATMENT AND RESULTS IN 35 PATIENTS WITH PRIVARY	DDOS DUM
IN WHOM A OPERATION OF HEAD AND AND AND AND AND AND AND AND AND A	BRUNCHIE CT / IS

Operauos		Se .		Pth		Ŀ	Co sees		Res La					De	.bs	1	
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Tai		_		6	~	一	Ti	3	┪	-1	-	-	$\dashv$				F-17

been employed in only a few patients. Our experience as well as that of others (14 19) surme to that penicillin may be of even

more value than the sulfonamides in the prevention of complications

In order for the patient to have the be t resi tance against infection a good general condition mu t be maintained Kepeated blood and urine examinations plasma protein d terminations and blood ulfonamide level are made to in ure the be t no sible management

#### PHIMARY ERONCHIECTASIS

I'le treatment of bronchiecta is remained a difficult problem for the sur\_con until the t d cade but recent re ults indicate the marked progre which has been made

In 10 3 Graham (8) reviewed the litera ture and found that in 48 cases of lobectoms for bronchicta i there had been an oper ative mortality of a per cent Because of the haard of lobectomy be devised an operation which he termed cautery preu monectoms and in 19 reported a cases with an operative mortal ty of a per cent (o) The mod m eperation of in le tale lobactoms was first m de by Brann in 10 0 who reported 6 operation, with 4 cure

unimproved and i dath. Shenstone and Janes of Toronto improved on the methol of Brunn by use of the tourniquet Since 19 9 almost uncredible results have been obtained Stati ties from leading clinics in the United States and En land reveal that the average mortality for lobectomy in bronchiectasis is now only about 5 per cent ( ) As has been pointed out there are a number of factors that have been re ponsible for the lowered mortal ty

Table I hows the treatment and results in 36 patients with primary bronchiectasi on s hom 45 operations were made. Of this group o had bilateral t v ! m nt The patients rang din a e fr m t year The case have been divil lit t group depen! ing on the type feet nemployed viz (4) di cti n te hnique r (B) tourniquet technique Lach gr ur has been furtier abdivid d into the parts ( ) patients in when roul nmiles ver ued () pa tients in wh m ulf nam les were u cd veterically a i ( ) tients in whom II ramı u i i th s temically and leally

1 Ds 1 11 1 e I thi encs f to patient li e et d if mile therap Group I c it I I gate t f maks an l

TABLE II - PESULTS FOLLOWING LOBICTONY OF ENFUNONMENTALY IN SEVEN PATIENTS
WITH CHPONIC ROSSILCING FULMONIRS SUFFURATION

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A 1 ectas Emp m m F ha w Pine m ewn
L celle

i male. Bilateral pathology was present in one of the patients. This group received sulfonamides systemically and developed no postoperative complications following sur gery. The results in this group of 3 patients were excellent. The second group con isted of 7 patients 4 female and 3 male with bilateral pathology in 2 cases. Of the 7 satients a developed an empyema following operation (no fistula) which healed following open drainage. The results were excellent in all 7 patients In 1 of the bilateral cases only one the has been treated surgically. One patient died 1 year after operation of pn u monia ju t before a contemplited & ond operation for bronchiectasis of the apposite lung

B Tourniques technique Group I Sixteen operations were performed on 11 femal's and mil s the tourniquet technique being used but no sulfonamid's In this group is of the 16 patients had bilateral disease post perative complications were more frequent in this group than in any of the other groups fo toperative atele ta a occurred in 3 patients an encap ulat I emprema d veloped in 12 8 of whom d morstrated a tronchial fistula and a patients had pneu monia Of the group f 16 patients 8 had excell nt result | 5 goe l | fair | poor and there was a death. A patient with Lilateral involvement hed adays foll wing peration of In um nia (1941) There have been faths due to the disease in the group. One

was a patient with bilateral disease who died of pneumonia over 3 months after surgery. The other patient died of acute nephritis and pneumonia over 1 year after surgery.

Group II I ifteen operations were made on 8 female and 7 male patients the tourniquet technique being used with sulfonamides administered sy temically Bilateral bron chiceta is was present in 11 of the 15 fa Empyema as a complication was present in 10 patients with 8 having an associated bronchial fistula. One pati nt developed preumonia. The results were excellent in 6 patients good in 4 and fair in There was rearly death and I late d ath and more surg ry is still contemplated in a The early death was in a patient with bi lateral involvement who developed an empy ema bronchial fistula and progressive in fection of the che t wall which exentually led to a transverse mychitis 6 weeks following sur ers. The late death was in a patient with fulateral involvement and was due to a e mplication of the discase namely metas ta is to the fram 11/2 years after an operation on the more involved ade

Group III The third group consisted of a halateral ease 2 m les nd females fin these patients the tournique technique was used and ulfonamides vere given 1 oth le criffs and vistemically. There were n pet operative e milliention and the r sults were ext flent in all 4 patients. These operations are all mid within the past 2 years.

TABLE HI - RESULTS FOLLOWING LUNG RESECTION IN 7 PATIENTS WITH CASTIC DISEASE OF THE LUNG (INFECTED)

C«	,	P h	0~e	FE 108	Sulf :	Sulf Therapy		C > ~						
		Lobe	1	Tou	~ =	Loc 1	11	Em	1	Eneu	Read	1	R ·	ı
	1 C	LL.		+	+		i —	+	i		E	╁─╌	_	
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3	1 F	RI	+	1	+			<u> </u>	i		E			
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	P C.	RI	+		+				i		E	·		—
	DO	LI.	+		+	+					-	F	-	Q*C
	L١	RL	+		+	+			-		E	Γπ I		

## TABLE IV -RESULTS FOLLOWING LUNG RESECTION IN 6 INTHINES WITH BRONCHIECTASIS ECONDARY TO PULMONARY TUBE ACLLO ES

E. H	RIARL	1+1	7	T +	+ 1	1 0	I'm ton
t s	RL	+ +		+		_ , t	d by los
S B	LL	+ +	-	1 +	i	F	
1 A	LL	+			i -	F	
5 M B	1.1.	) +   +				-	
L E	RL +	1 1 4		l			

## TABLE 1 - RESULTS FOLLOWING LUNG ALSECTION FOR BRONCHIE CTASIS FCONDARY TO BRONCHIAL TRAYOR (3)

G t	RL	+		+		+			D	1	R	ok ok	nc h	í.
W W	RL R f & RL	-	+	<del>-</del>			]-	-	3	7		_		

Dis dissectio T tourni A I lectais Em mpy F to lo P ne s

#### CITRONIC DIFFUSE PNEUMONITI

Table II shows the treatment and results obtained in patants with chrome n n pecine pulmonary suppuration. In the pati nits the pathology was located in a lower lose in , in tances. In all these patients the pathological picture was that of a distinct present without cavity formation. In 6 of the , patients sulfonamed vere administered systematically and in 4 of the , the operation was performed by the discerting technique. The patient receiving no ch motherapy developed the only complication in the entire group it king, an empyerial formation in the entire group it king, an empyerial formation in the other promotion in the control promotion.

r adily after pen dramage. In the only pneumon t my in the series penicillin was place I in the 11 ural cavity. Complete R h I of symptom va braine I in all patients

#### INFE TED LUNG CYST

Tab! III sh with treatment and results obtain I in it tent with infit ted eyst of the lun. In the lattent the disection technique wa used and in post perature to emplicate in the latter that me whom the totarrey it hinge was used to the latter to the latter with the latter latter with the latter latter latter mps mas and ne hall a borochial it to like his victor.

vere salisfactory in both patients. Sulfen amiles were administered systemically tail these individuals. I wa also receive learning in the penicilin systemically and one locally.

## TUBERCULOSIS

Table IV illustrates the Ireatment and end reults in 6 patients with bronchiectasis secondary to pulmonary tuberculo is nathological lesion was in the left lower lobe in 3 the right lower lobe in 3 and in 1 of the latter also in the right middle lobe. In 5 of the 6 nation1 the tourniquet technique was employed and 4 patients received sulfona mides systemically Tatient L H had an empyema with fistula following surgery Her condition was unimproved like to the persitent luberculosis in the right upper lobe I atjent VIS developed atelectasis in a tuberculous right upper lobe following sur gery She continued to have tubercul is of the ri ht middle and right upper lobes but al present her condition is imprive l tient SB developed an emprema but the tinal results vere attisfactory latient VM developed a fistula following surgery which healed everal month later the ha lacen asymptomatic for 5 years The remaining 2 patients had no complicate us following surgery an I were relieved of their symptoms

### BRONCHIECTA I SECONDALLE TIM K

Table 1 presents the treatment and end results in 3 jatunts with brenchic tasis secondary to bronchial tum r In patient GM the right I wer lobe vas involved. This was removed by the disc tion technique an I he receive I sulforamiles vistemi alla. She developed an infarct and an emptema and died i days f flowing perati n due to retr grade thmmbo 1 and pneumonia I a ti at W.W. had the ri ht lower l be rem wed It the tournique technique to ulfora mil s a re given thire were no omphia tin and the patient has been complitely reli ved of symptoms. I attent RT I al the ri ht mildle and ri ht lover lobes removed by the disection technique, Sul'onami les ere given veterically. There were no complicati is and the final result was excellent

#### DISCUSSION

The morbidity and mortality a cented with the surgical treatment of bronchieclasi may be influenced by a number of factors (3 1 ) In addition to those already di. cu sed the age of the patient duration di tribution and severily of the disease markedly influence the course and results of surgical treatment. In the series of 36 patients studied (45 operations) o had bi lateral involvement and as pointed out by Blades and others the surgical rik is con siderably greater than when the lesion is limited to one side. There were two operative deaths and both followed the fir t operation f r bilateral inv bement. I ight of the 20 Libraral group have had both operations ompleted the course following the second peration being less difficult than after the This is partly due to the marked iniprovement that u nally follows the first operation thus making them better surgical n ks and also because little or no diseased lung remains after the secon loperation

The total amount of lung is see that may be safely remixed his been investigated by Heinc and Andrus (11) and others as well as by ourselves (1). Dogs have been observed for everal years I llowing the reduction of lung function to a single upper loile (15) per cent) and is lien at rest appear entirely normal. When phaced in a pre-sure chamber under related atmospheric pressure the re-puratory reserve compares surprisingly well with that of normal animal.

Clinical experience shows that human being may also tolerate the removal of a large percentage of the total lung capacity crid am (10) in 1940 reported the successful removal of both 1 ver lobes the right mildle fole and the fingula of the left in per lobe without the production of despines or other thy ical handical. In 2 of our 8 completed italieral operation the same amount of lung resects in was mide. Both patients returned to full time work following surgers.

When bilsteral operations are contemplated ufferent time following the first operation for complete recovers and obtaining its beneficial effects hould be allowed. This interval between operations may vary from

6 to 12 months or more depending on the o currence of complications and the events of the case In one of our 8 cases the second operation was attempted 3 months following the fir t and because of the slow return of diaphragmatic function following the first stare had to be abandoned. It was per formed 3 months later without difficulty. In

other cases death occurred (pneumonia meningitis) ju t before the second operation had been planned. This had been a year and 1 2 year respectively following the first

operation

In evaluating various factors contributing to the provess of surgical therapy care mu t be exercised in order not to form erroneous conclusions Statistics are often misleading even to those who are most acquainted with the facts

In Table I Group B I and II the operations were on poor risk patient made 3 to 3 years ago when the operative tech nique in addition to mattress sutures en tailed the use of a ligature placed about the hilum of the lung as the tourniquet was being removed. This may partly explain the high incidence of empyema and bronchial fistula in both group in pite of the fact that sulfonamides were used in Group B II In Group B III this ligature was not used and no complications resulted

Groups A I and II are too small for com parison however when the patient pre sented in Tables II III IV and Vare included the results are quite convincing namely that the local and systemic use of sulfona mides in combination with the dissection technique is the procedure of choice in lobectomy for pulmonary suppuration In patients treated in the manner there

were no bronchial fistulas and only 3 emps emas. As stated earlier penicilin max re place the ulfa dru s as the chemotherapeutic

a ent of choice

In pneumonectomy the pleural cavity is not drained following operation. The local sulfonamide therapi is le s d'irab e berau-e of the ill effects of rapil accumulation of fluid in the pleural cavity and collapse of the remainin lung Penicillin however if de po ited in the pleural cavity may remain in effective concentration for a to 4 lours and without the producti n of an undue am unt of pl urd fluid

#### SUMMARY AND CONCLUTIONS

The result of lung re-ection in 39 cases of pulmonary uppurative diseases are pre sented and the various factors contributing to its pogres are discued Chief amon these wer rapid complete expan ion of the remaining lung replacement of blood los avoidance of anoxia and presention of serious infection following operation. The di ection technique of re-ection i the procedure of choice in mo t cases Chemotherapy has been a major fa tor in the prevention of scrious po toperative infection. There were 2 d aths in 45 operation made on 36 pa tients with bronchiectasis o of which were bilateral

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## CRANULOSA CELL LUMOR OF THE OVARY

A Clinical and Pathologic Review of Sixty Two Cases

JANE I HODGSON M.D. MALCOIM B. DOCKERTY M.D. and ROBERT D. MUSSEY M.D. Roch t. M.n. es. ra

listed as representing advances in our general knowledge of the origin life cycle and physiologic side effects of granulosa cell tumor of the ovary.

1 The experimental production in mice of the neoplasm by menus of rountgen rays (11 12 1<sub>3</sub> 38) has resulted in histogenetic studies tending to support the thesis of lashel namely that granulosa cell tumor and thea cell tumor are derivatives of the ovarrium mesenchimm. Corroborative evidence is af forded by human material in which a mixture, of granulosa cell and thea cell elements take place within the ame neopla m (4 18 25 30).

in (naulosa cell tumors how, or one may he inclined to regard them hit logically at times have proved to be chincilly mahignant to recur and also to metastasize. (6-14-49-30) Moreover the tumors that had metasta ized had histologic pi tures identical with those of so called being naturnors. Be cause of this observation a radical operative procedure usually 1 performed e pecually when the case 1 that of a voman past mid-like.

3 Direct proof of the so cille I functioning capacity of granulosa cell turn r has accumulated with a diditional reports leving with boas us of turnor ty us for extre one homen (e.g. 3.1). This hommon frequently has been found to be present us excessed amounts. Moreover similar method using blood and unne a tit material for eximilation have demonstrated measurable quantities of circulating horm in the level of

A denomic of these suchmitted in the Facus per here's Chool (htt erry 131 err) [11 at least of the content of the per here 12 for the facus of fractions of fractions of fractions of fraction of the content of the con

which drops precipitously within 45 hours of the time the tumor is removed. Quantitities chemical analysis for lipioid content of tumor tissue has demonstrated high values for cholesterol and chol-terol esters, the building stones of the estrogen molecule. The postmenopawal bleeding so commonly noted as a symptom of granulosa cell tumor and the occurrence of amenorrhea in young women are clinical cydence for a condition of hypprestrinism

4. The luterization of granulosa cell tumor tirst described by Lecene in 1910 and noted by several other clinical investigators (2 6 17 7) also has been observed in the tumors produced experimentally in animals. Whether the horizone projection also is secreted during what might be termed the reprining place of granulosa cell tumor 1 a matter for future study. The simultaneous inding in a patient of a processtational endometrial picture and luterized granulosa cell tumor would lend positive support to the progesterion the is Several of our cases presented this interesting combination of conditions.

c The coem tence of granul a cell tumor and endometrial adenocarcinoma ha laca noted 13 several investigators (6 32) Simi larly mammary carcuicma has been observe I to develop before or after the removal f a granulosa cell type of ovarian tumor (o) The a sociation of these two le ions to say nothing f the concomitant incidence of uterine leiomyoma in more than 50 per cent of cases has led many physicians to the belief that prolong I hormonal stimulation of the brea i an l'uteru has in fact been re pon ible fr ne place in the e organ The almin t tration of e tregenie substance t certain of the lower animals has this result (10 34)

PURPOSE OF STUDY MATERIAL AND METHOD

Purpose In 1039 one of us (Dockerts 6) collaborated in reviewing the pertinent clinical and pathologic data in the record of 3, cases of granulosa cell tumor from the files of the Mayo Clime Since a further tude of approximately 500 millellaneous ovarian tumors revealed some cases that had been overlooked in preparing the 1939 report a well as some subsequent case re-examination of this ubject seemed to be worth while e pecially in view of what we have learned in the 1st half decade concerning the type of ovariant tumor.

Material The material which forms the ba is for this report on its of 6 cases of granulosa cell tumor encountered at the Maxo Clinic between 1910 and 1944. Is previou by mentioned 33 of these cases were reported in 19.9. The tumors had been removed urgically or had been encountered at necropsy cally or had been encountered at necropsy and 14 cases, the uterus with its endometrium was available for tudy and in one additional case simple curettement provided material for a study of the endometrium. All the pecimen had been preserved in formulae hade.

Method Gros pathologic studie of the tumors first were carried out with particular attention to location use color constituency degree of eneap ulation and 4 forth presence of mature or devel pune fell 1 s and coppus luttum. The uters were in ject 1 for enlargement and flut myoma. The thick ne s and character of the erdometrium tout. A careful search was made for polypand mall carcinomatous rees in which prevous him thave caped detection.

Multipl blocks of it to then we cut from the tumor the contralateral ovars the uteru and the endometrium and these were placed in a first his per cent solution formalin. [I per cent firmal I hids] Nu merous secution section next y recut on a freezing in rection and at 1 at 1 l. h. chrome methyl ne bli, in an eff it to seed which flocks we re to be treated by jeculi method. The blicks ubsequantly were taired routirely with hematoxylin and cosmomer tain for reticulum and cidar III.

stain for lipind. Section stained with Feratoxshin and it in were con idented situfactors for a study of the unmyolyed ovariand the blocks of myometrium and ermetrium. Both the freezing and the parair method were employed in all in tance. Larger blocks of tissue were removed from four tumors for determination of Ipeil. These blocks were taken from one lutening and three nonluteinized tumors for purps of comparance.

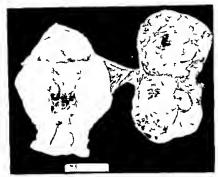
By way of further comparison portion of even normal ovaries wire analyzed in a similar manner after care I ad been taken to avoid includior such tructures as developm or mature corpus luteum v hose high content of lipoid mishi mullifus comparative re ultis. The lipoid content was determined from an alcohol-ether extract. For the e-timation of colesterol and cholesterol esters the method of Bloor and knud on was employed. The determinations of pho-pholipid were mad according to the method of Youngburg and Youngburg.

#### CLINICAL DATA

Incidence Sutty two (163 per cent) of the Mayo Chine between 1910 and 1944 were of the granulosa cell type Seathmary found an incidence of 00 per cent in a imilar largeness. Schreed relieved 3 per cent of sol I ovarian ne 11a m wer of the granul a cell type.

lee licag of patint in th 6 cases rang I from months to average are ting vears second an I third d cad's ach accounted fir 1 case Th furth l cal accounted fr 6 In the th 6th and th cades we lite! arl a pat nt re pectively Four patents & mre thin o years of age (return r (16 | rent) curredd ng th 1 f beral vea (3 nt) during il reit icus pen l 1 8 (6 Dt I ce t) auli le la if l urn in tl postrzen pau al peri 1

Marrice 'p era v lity fu lith 6 patiert wr marilanlown n l of the marrel pat nt 2 1 r c nt) were r l paro s This i cidence of infer



If Puigds spears Cralovallim fihlft y \ poistoyll h k g fgostizt \ i hypetfly ftru ] p lyped i t

tility is somewhat hi her than in an average group of matried women. There surgued irrn val of the granulosa cell tumor 3 of the 12 patients became pregnant. Of the 42 women v ho had had children 15 were multi-paras and 7 were primiparas the total number of children was 105. Phus it will deem that parity of the women might have been influenced. Conversely however it appear that parity has n influence on the kylopment of a granuly a cell tumor.

Ircious operative procedures. Operations had be nearried out be where in 18 cases in 7 cases unlateral without comis had been performed for some type of ovarram neo farm the exact nature of which could not be determined from the record and the drig not of recurrent granulosa cell tumor was not considered until the ultimate oute me indicated baseds highlighted in 8 cases uterine curette ment had been performed at intervals ranging from menths to 7 wears per youl. To pattent had undergone his terectomy one for uterine tite myoma and the their for menoralizaga. The eighteenth

patient had had bilateral radical mastectoms for caremoma carried out 6 years and 13 weeks respectively prior to registration

#### SYMPTOMS

etterine bleeding 1 his symptom was present in 46 of the 6 cases (74 per cent) and represented the mot common complaint

In the one case in which the patient was of preputeral age, periodic vaginal bleeding had occurred at the age of 17 month.

Of the 3 patients who were considered to be in the reproductive period 13 suffered from menometrorrhagia of varying duration I rhaps of m r. intere t was the fact that in 10 of these 13 case the bleeding had been pie ed d by episodes of amenorrhica la ting from 1 to 7 years Szathmary too noted that in 43 per cent of sexually mature, 1a tients the granulysa cell tumor at 1 arently had caused an initial period of amenorrhea One patient of men trual age of implained only of high menorrhagia.

In the group of 38 patients who had pa sed the menopause leeding was present in all



i left helve fi ed em h grossly nn i gu \ t m ke crase hpodd poxts d ed by d L pou (d 1111 X 57) bit diel ere t t (secri ry) phase i the mastru i y i pesen i i temuz digr los celli m (h m i y l d o × X 60)

case The bleeding occasionally tended to mulate men truation occurring at fairly regular interval ranging from to 8 weeks. The discharge often wa de cribed by at tents as re-embling mensitual flow it was schom profuse or of low duration. Three of the 38 patients gave hi tone of premature menopause these may represent examples of an initial amorthe a resulting from the tumor.

On to year old patient had had her last men trual period at the a c More or le regul r aginal bleeling re curred then he wa 66 1 6 year old nationt who had had irregular varinal bleed tag for a year de cribed a perio l famenor rh a between the a e of and 10 A year old patient who had had a mal bleed in for month halhalam n rrheabetween the age of 1 and 35 A period forcegular bleeding had en ued but had ase 1 after administration of a minipassal like t roentgen therapy at th a pos ible duration of the cranul a ell tumor in these 3 case namely 6 and 1 year not incon a tent with the nature of these In the 1939 report ir m the lim a case wa cited in which th kn vn lurati n ua i vears

Intenorthea Of the 3 patients of men rural are 5, 22 per cent) complained of amenorthea lasting from 1 to 7 sests the amenorthea was not followed by bleedin a described in the fore-one, para-raph Fix of the 23 had normal men trual hitorist count of all patients who had complaired of amenorthea at some time excludin those whose granulosa cell tumor undoubteld excloped late in hife showed that amenorites occurred in 18 of 26 patients.

Ibdominal enlargement. In heten of the 6 patients (9 per cent) complained the 6 abdominal enlargement or tumor. Two additional patients regarded this symptom a 6 secondary importance. The duration of the at-dominal enlargement ran ed from 10 days to 1 years and in the majority of 10 tances its growth was described as for

Pain Although pain was a symptom !
25 cages it was the major complaint of only patients. Rarely severe it was most frequently de cribed as a bearing down of the feeling on the side of ovarian involvement.

Miscellaneous Complaints such as unlary incontinence and dribbling falling of the womb and o forth occasionally were



graph

noted Two patients complained of tender ness in the breasts

#### PHYSICAL AND LABORATORS FAMILYTIONS

Physical findings In 43 of the 6 cases (69 per cent) an adnesal tumor prisumably ovarian was pre nt In 14 cases the presence of a large uterus with or without fibrimpyomas was sup-cited in several cases large fibromyomas made accurate pri pation of the vidicial regions impossible in a cases no pathologic lesion of the pelvis was palpated operation liking undertaken main's because of per timen it suical keding Mammary hypertrop by ha i not been obtained in the case of the performed because of arrinoma Laborat is his lings. You properative endo

crine studik were perf rmc l In the case of a 7 van sid v oman wh had a granulose will tumor determination of unitary e t team were made during the fr t 45 hours 8 rat units of estr n were exacted in each later of unite vone wa found durine the second latermination. The Irop in the 1 unitary extraction over points with the fin in fother my studiest results.

One fairly consistent laboratory finding, was a low value for hemoglobin the average value being 11 grams per 100 cubic centimeters of blood I eadings as low as 5 grams were obtained in several cases. This observation was constant with the clinical samp tom of uterine bleeding but was not actually prefit as a paid in differential deepoiss.

tom of uterine bleeding but was not actually pecutic as an aid in differential diagnosis. The results of lipoid analysi of tumor it sue are recorded in a sul-quent para

## PATHOLOGIC DATA

Mac oscopic findines Location All 6 to more were undateral with the right and left ovaries sharing an approximately equal in indince of involvement None was of extra ovarian origin (3 33 41)

Size The large (tumor weighted 34 pound (1) (4 kgm.) and mea ured 40 centimeters in its greatest diameter the mallet measure I 4 millimeters in diameter. No apparent correlation existed between the age of the patient the ize of the tum r or the duration of symitom.

Color and con 1 tenes. The c lor of the tumor ranged from a light cream color to a lrown h black the m t comm n c lor



Ad ocures one grad 3 fth rd July 3 93 b den searce om lary od them a 3L deou Y5) na ed i l flicua deyli ir ipat m f g Ap 120 945 d ad t nn fund (hem t mL d cos.2 75 and tum f breast.

bein a brownish gray. The characteritic central re in f wit nin" and ) ( 4 per

color and consistency of liver saura e often cent) wr 1 tin tely yt Letulati n was was noted on the cut urface Tw nts ix a tairle c n tant f atur. In the la get mors tumors (4 per cent) w re sold thro bout necrosis and h m r has a feet mors (44 per cent) were semisolid but with a d prod it lack frial zine f arial

size Twenty five per cent of the tumors vere grossly edematous Xellowish orange regions suggestive of luteinization were present in about 3 per cent of the tumors

(Fig. 1) Learning that the same such as the same shadows

Ascitis In 6 cases moderate to large amounts of free fluid were present in the peritoneal cavity. In one of these cases fluid at o was present in the chest (Mugs syndrome caused by granulo a cell tumor rather than ovarian fibroma). Seates was not found in sesociation with mail tumors and it was our feeling that as with fibroms (8) the pre-sent of free peritoneal fluid was related to obtracted circulation (ed ma) within the tumor or its pedicle.

Associated pathologic lesions Of the many pathologic lesions associated with granulo-a cell tumor the high incidence of uterine fibromyoma and of uterine hypertrophy (sul involution) is noteworthy (Table I) The elservation also has been made by other investigators. The presence of fil ro my mas and hypertrophy together with the occurrence or reactivation in one case of extensive endometrio i with a large tarry cy t in the normal overs may be viewed as an intere tin manife tation of hyperestrinism The imultaneous occurrence in 8 cases (13 per cent) of a sociated adenocarcinoma of the uterine fundus i indiel surpri ing and cannot be explained adequately on the ba is of chance There were 3 cases of mammary carcinoma

Mic oscopic findings has much a the micro scopic appearance of granulous cell tumor repeatedly has been de cribed in the literature no attempt at detail I repetition is rece sur I ollicular culturidori liftuse and peud a tromatous cell patterns were all represented in our series. The follicular

TABLE I -- PATHOLOGIC LESIONS ASSOCIATED
WITH GRANILOSA CELL TI MOR IN 62 CASES

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patterns predominated in 15 tumors (24 per cent) the cylindroid with all its variations in 30 tumors (40 per cent) and the sarcoma told in 1, tumors (27 per cent) The sarcoma told group which included the 3 cases in which clinical malignancy was evident an peared to be the most active type from the tandpoint of cellular division (mito 1) The recude adenomatous arrangement of cells was found in cattered regions that were pre dominantly cylindroid in no in tance was it the only fattern observed. Luteinization of varying d gree was evident on gross and microscopic examination in about cent of tumors The cells in these regions had lo t their basophilic trining and had become loaded with lipoid sub-tance which tained inten ely with sudan III (Lig luternization appeared to be reflected in the endometrium in 3 cases in which changes (fa secretors nature were present (I is This is perhaps indirect evidence that the luternized granulosa cell tumor produces pro te terone in addition to estrogen but actual biologic proof of this phenomenon is still lacking

Using Broders method of grading the tumor was graded 1 in 45 cases (73 per cent) and 2 in 17 cases (2, per cent) lour of the 5 so called recurrences were of a higher grade of malignancy than was the original lesion

Twelve (19 per cent) of the tumors pre sented microscopic features of combined granulosa cell tumor. The fourth patient is all the vears after operatin for a so-culled recurrence in the contralateral owars. The nith patient died to vears after operation Mthough we have no actual proof of recurrence her case was so hated because of a history given by her family of recurrent vaginal bleeding prior to death.

from the relatively birth incidence of climical malignancy as evidenced by re-currence of the neopla m in po timenopausal patients it would seem lovical to advise total hysterectomy with bilateral salpingo-oophorectomy for granulosa cell tumor Among 4.5 patients of all ages who received this latter type of treatment there were no recurrences. In the literature the recurrence rate for granulosa cell tumor varies from 4.5 per cent (von Pallo oo caves) to 5 per cent (von Pallo and Brawner 3 case)

Conservative surgical procedures were car red out in 5 cases in which the patients were les than 4 year of age. There were no recurrences in the group and 3 of the patients sub-equently became premain. If thou h the portion of our serie it mall it is our impre sion from reading the Interature that conservative operation is a safe procedure for young women when the granulo-acell tumor 1 well eneap ulated

Irradiation In the experimental animal (mou-e) granulosa cell tumors have been produced by the use of roentren ray que tion might therefore be raised as to what timulating effect intrauterine radium theoretically mucht have on the ovaries f women later found to contain granulosa cell tumor. In 6 of our cases radium had been employed in the treatment of po tmeno pausal bleeding. In several in tances ce sa tion of bl eding indicated that the radium did not cause a tumor but had a dennite retarding influence on a pre-existing granulo-a cell tumor One of these case wa reported previou ly by MacCarty and one of u (Dockerty ) The pertinent letail another case foll w

N II m lt pa r hai h i m rrh f N rs fit th birth ith ec d child at th ee f 3 M m trorna a been h as 35 rs f dec t ed f 8 y and teth c fide pel ct mor which a dar ed here in ppea ed. Retrete than a training a fine fide per a fine fide per a fine fide per a fine fide per a fine fide per a fide per

This case illustrates retrogre ion of a granulosa cell tumor with control of postmeno-pausal bleeding for a period of 6 years as a direct re ult of roentgen therapy. On the other hand roentgen therapy failed to prevent recurrence of the tumor as was also true in the other cases in which the pati into the other cases in which the pati into the other cases in which the pati into the chimse can be made in 15 additional cases in which postoperative roentgen therapi was even. It is extremely difficult to evaluate the beneficial effects of irradition in the case of a neopla in which like the granulosa cell tumor posesses such a 1 v incidence of clinical retruitence.

#### SLMMARY AND CONCLUSIONS

Suth two granul sa cell tumors were removed sur<sub>b</sub>etalls at the Mayo Chine between 1910 and 1,24. The con titutes 1 63 per cent of 1 800 ovarian tumors encountered duran the period. About 60 per cent of these tumor vere found in women who had pa ed the menopause.

The most common clinical symptoms were uterrive bleeding. (4 per cent of 6 cases) aim norrhea (2 per cent) and abdominal en largement (20 per cent). Frem a study of the record it was apparent that the tumors that produced these symptom grew lowly and in the action per cent for as lone as a sea.

Linary a say perfirmed in the case of a main a f year yere positive fr 8 at unit 1 t on j r liter of urine exceted durin the first 4 postoperative hours.

The except in fe to n dropped to zero

during the next 24 hours. Blood and urine assays should be performed in these cases both properatively and postoperatively to widen our information concerning the excretion of estrolen as well as to aid in clinical diagno is

Further evidence of hyperestrinism is produced in our series by symptoms of pre occusive puberty amenorities and postureno pausal bleeding and is supported by the incidence of adenonyosis and endometriosis (6 f.pr. cent.) which often occurred in post menopausal patients uterine fibromyomas (316 per cent.) uterine hypertrophy (56 per cent.) and prohiferative endometrium (67 per cent.)

Differentiative (ecretory) changes in the endometrium were correlated in a cases with internation in the granulosa cell tumor Lutemization without the expected endometrial change was observed in 12 additional tumors. Thus the deduction that granulo a cell tumors may produce the differentiative hormone progesterone is suggested. Efforts should be made to obtain biologic proof of

the phenomenon. The high incidence (21 per scnt) of endometrial carcinoma observed in ur. 8 post inconjunction in the high care inconjunction in the properties of the 5 cases carcinoma of the breast with axillary metas asia slad obseloped. This phenomenon of cocusient ovarian endometrial and main many carcinoma in the luminan being bears a marked similarity to the results of experiments on laboratory animals in which estrogs in stimulation appears to be 3 factor in carcin stimulation appears to be 3 factor in carcin.

lathologically the turn it appeared to follow order of malignance said termined by histologic grading. They formed to the wile tall lished pattern will perhaps a but much lence of lutetimeat it and a suprissing number of cress ((2) in the an almettur of granulose cell in fill a B f m ft x total. The distinct is between the total most and it is a but to the suprissing in the series of the total transport of the suprissing in the series, we limit to have a but to the suprissing the s

however alver impregnation method are helpful

Chemical analysis of four granulesa cell tumors indicated an excess of chole terol and collecterol esters as compared to the normal content of these substances in the ovaries. In general, this increase in lipoid content was thought to be related to storage of c trogenic hormone. By contrast in our cries the phospholipid content of the tumors was sur prisingly low. Analysis of luterized portion on the other hand or veiled incre. (d amounts of both substances.)

In this group of 62 cases of granulosa cell tumor there were 4 definite recurrences and 1 possible recurrence. Con cryative surgical procedures among postmenopau al patients accounted for 4 and possibly 5 failures to obtain good results. Thus a recurrences and a deaths occurred after conservative opera tions in the po tmenopau al group apprecial k incidence of recurrences among older patients indicated that bilateral popho rectomy with hysterectemy is advisable for granulo a cell tumors affecting namen pa t middle life. Le s radical precedures en the other hand seem to be indicated for granu losa cell tumor am ng yeunger women ina much as no recurren es were noted and pregnancy sul equently courted in 3 ch es

Our experience with p topyrative ir radiation for granula a cell tumors in post men pau all priticults in the influent to marrant recommendations c neering this mode of treatment. However, we cannot state that uch treatment implification of the tumor axis preduce temporary regression with e-sation of ps timenog and bleeding. If granulosa cell tum is are to be cured by it ridiation agravantis the disage must be much like the view of a fault phone the mun hutberto comployed.

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## CONGENITAL MALFORMATIONS OF THE FIRST HIORACIC RIB

## A Cause of Brachial Neuralgia Which Simulates the Cervical Rib Syndrome

JAMES C WHITE MD FACS Capt 1 MC USNR Boston Ms chusett
M II POPPEL MD Let na t C mma d MC USNR New 1 k New 10 k
RALIII ADAMS MD FACS B to Massach setts

Sa result of a large number of published articles and wid clinical experi ence the circulatory disturbances and neuralgias of the upper extremity which frequently result from cervical ribs or hypertrophy of the anterior scalent mu le are well understood. In 1016 Halsted was able to find 716 case reports of cervical ribs It is not generally appreciated however that a similar picture may be produced by a congenital abnormality of the first thoracic rib We are taking this opportunity of reviewing the literature and adding 10 new examples of this little known anomaly. Tive of these have come to operation for relief of specific complaints while 5 others have remained wholly asymptomatic Roentgenograms are reproduced of 8 of the ro ca es to illustrate different varieties of the deformity

#### REVIEW OF LITTRATURE

Judging from the lack of general knowledge concerning first rib anomalies their existence should be extremely rire. This however is not the case. Is long ago as rotz Wingate Told (65) reported that variations in the hape of the first ril were very frequent. While such deformities have been encountered repeatedly by anatomit is and have been described as di-secting room curiosities and in feent years have aroused the attention of a few ra hold gots.

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clinical recognition they deserve. Haven in reviewing 5000 routine viray films of the chest found 38 abnormalities of the first thoracic ribs against 37 cervical ribs these 38 cases to were in males and to in fe maks. The abnormality of the first rib was bilateral in 2 cases 17 occurred on the right side and 10 on the left Furthermore the incidence of symptoms was at the same low rate in both groups of cases as only 2 out of each group had any complaints referable to the deformity. In recent studies of large series of routine thoracic films Etter found (8 cervical and 31 abnormal first thoracie ribs in 40 000 and Sycamore 10 of each in 000 students at Dartmouth College It is there fore probable that if radiologists in general scrutinized the routine chest film with pecial attention to the bony construction of the thoracic agex many more minor variations in the first ribs would be detected

The first unmistakable anatomical report of this malformation has been attributed by Dow to Ilunauld In 1740 he communicated to the Royal Academy of Sciences in Am ter dam a memoir (2 ) on variations in the num ber of ribs. He de cribed a portion of an adult skeleton in which the first rib on each side well formed posteriorly and articulated with the first dorsal vertebra became blended with the second rib which was by the union much larger than usual This anomaly mu t be very imilar to that which is illu trated in our thirland or bth case. Downle cites the early dissecting form in high of kn x Sandifort Turner (67 65) and Struthers all published prior to 1875 The earliest revi v of the literature vinch we have been able to find was written by Arbuthnot Lane (14) in 1885. Ten years later Helm de enbed 16 cases which he had been able to find be tween 1853 and 1885. Keen added more of his own and 19 other references were cited by Jones in 1910 Most of these are descriptions of anatomical and postmortern di sections and contain no account of clinical symptoms or operations. In the part overs cases have been reported by Hyoslef Clerc Didier and Bobrie Brickner and Mdch Jaubert de Beaujeu and Rollin (29 30) Bruett Re mine Carroll Gladstone and Wakeley Levi Henry Lindgren Adsonand Allen and Walshe Tack on and Wyburn Mason other references have been given in the e papers which are not included here. Many of these more recent writers report cases of pa tients that have come to operation

Brickner and Milch (8) in an article which appeared in the journal in 19 5 and Wal he and associates in a de cription of 3 cases which reached the country while this paper was in preparation have given particularly valuable presentations of this ubject. We have taken the liberty of quoting exten ively from these two excellent reports As far as Brickner and Milch could determine the credit for having recognized and de cribed the production of symptoms by an abnormal hrst nb hould go to W W Keen One of hi two cases report of which was publi hed in 1007 was in a 1 year old man with the his tors of a long tanding mass in the neck and a a month old brachial neural ia Roentgenograms showed that on the left side the first rib instead of curving forward from the spine as does the right changes its direction at its articulation with the transverse process and thence runs almo t in a traight line down ward and outward. The tip of it is lo t at the point where the first rib and the clavicle on s No operation was performed on cach other either of Leen's patients

ANATOMICAL VARIANT OF FIR TIPE AND THEIR PROTOTYPES IN LOWER ANIMALS

The first thoracic rib may how a g eat variety of mallormation. These comprise rudimentary flustre and bripital bs central defects bridged by heamentous band.

evo toe and elongated jointed structures uch as are illustrated by Brickner and Nilch and by our Case 5 Correlated keletal van attoin among the lower animals and embryological causes of malformation in man both contril ute to our knowledge of the ubject Dr F T Lewis profe sor emeritus of comparative anatomy at Harvard University lass been of the greate t help to us in the preparation of the brief summary which follows

Variations in the development of the upper rib may be subdivided into three principal groups

I Fail: re of the ribs to reach the sternum Han n las pointed out that in vertebrate form as far back as the shark the number of ribs which reach the sternum varies from zero to a large number. All the ribs may rever connect with the sternum as in various f hes and the frogs or a eries of them may reach the sternum with floating ribs both above and lalou This is true of birds (Stre emann) and man where with the normal floating lower ribs there may be anomalous cervical and I formed first ribe In the earliest stage in both the I is and the cat continuity is lackin between the first and econd ribs and the ternum (Whitchead and Waddell) In man me t rudimentary first ribs form a syno tosis or p-eudarthrosis with the econd the type of bicinital rib de cribed in whales by Turrer (67) In these cases the junction of the ribs is usually close to the point of insertion of the anterior calene mu cle and the cro sing of the trunks of the brachial plexus and subclavian artery (Jones) Instead of fuling with the sec ond the first rib may sometimes bend at the level (I the ulcus (Bryce) or have an unusu ally high position (Keen) or remain floating in the soft thanes at the base of the neck (Keen I mer) Such floating ribs may have a lga mentous prolongation joining them to the co ond rib or the ternum (Todd 6 Dwn ht) 11 turns, the learmentous of its nagain become bore lef r it arti ulates with the manubrium (Down

The d sum f r bs int re tebral and serr I bony port ors D all n of the rils into sert I ral and I s n port in s the I eurapy physis and bemapog hyses of Owens

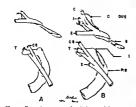


bt th hould This II i i ith typ al tes frat fill fret nb described by Mirso A pottit reeft gif sat the t

archetype skeleton is characteristic of ligards crocodiles birds and mammals (I bown Streemann Lickhan). In mammal ternal tiss may be, more or le calcitud, while in atmabilio they are well o sifed and articulate by synovial joints with the steroum and virtebral ribs. These are comparable to the human first rib with a central hyamentous portion as de cribed by Dow and to the atticulated ribs which are de cribed herein Helm has put forward the theory that such an atticulation in a rib may be a compensativy mechani in to provide sufficient reprators even ion of the che t in case of abnormal sweet to with the rib below.

Clinical and radiological de criptions ef jointed ribs have been published by Vino gra los who encountered the anomals in 6 cases of cervical ribs also by I tter and Hallermann. In the first thoracic rib this anomal, has been described by Luchka Lane (3) Sycamore Brickner and Milch (8) Re mijnse Jaubert d B auj u and Kollin (20 10) and Wal he and assecrate In the la t three articles four of these tirst rit an smalle are illu trated where the articulation is fur ther lateral and there I cally a short length of the fir tril beyond the junt which fuse with the second as a bony pur Wal be and hi oll agues have cla in 1 thi malformat na mextiof the send rit tutin some f they cree the bony projeting as Ingan I sed say resemble the uther faint that

it has seemed more logical to us to consider the anomaly as a jointed first thoracic rib Some writers have claimed that this condition t due to an old fracture of an abnormal rib but no accounts of significant injury have been recorded (1 tter) So called stress fractures of the first rib have recently been reported by Alderson but these as illustrated in I igure i appear as simple breaks in the continuity of an otherwise normal rib and in no wise re semble the congenital anomalies here described. In these cases also a history of severe trauma i usually lacking. Kochler (quoted by Alderson) has stated that fractures of the fir t rib are extremely rare and are g nerally pontaneous fracture due to mus cular contraction. They should not be e niused with developmental abnormalities of the first ril. We have been extremely kertical about the traumatic etiology of these so call d tre s fractures but one of us (VIIII) has recently had occasion to e mpare a routine cliest film in a young naval adet (lig r a) with a film repeated several weeks later because of upraclassicular pain which followed a heavy blow on the lipul ler This second kingram (Fig. 1 1) hows the type f fracture described by Alderson and present clear cut evil nee that it can occur a a result I trauma. It i therefore pe alle t th orize that uch a fracture coul loccur in the type f an maleus first rib illu trated m ligure 5 c and a the realt of non



F R pod ti ih hit modificati f dra s til b J esi h w in becal til ener f postaned pl ru in th d wl pan t f redm tarfreit th ar in b hain mellelab f hist rocal d first th rate ares the multiest b b C on pres. d paired gri h first thra in b hen see d the a pand n, inho ies harge bra hi branchaid n - sit i d t perati un Case

union from re piratory movement produce in some of the publication mentioned the type of jointed rib deformity de cribed and in our Case 3 (Fig. 1). We still believe however that these abnormal articulations which ar occa ionally found in the first rib are mort likely to be of dyvelopmental than traumatic origin.

3 Other features of anomalous prst ribs. Then, are further idiopathic development such as evo tow. (Carroll Marnard) and multiple center of o it cation—poradic and unaccountable irre-ularit. In the pre-ence of a cone intal hemivirebra the ir trib may be lacking allorether (Clad tone and Wake lev.) In addition to the abnormalite of the trib no cover tent abnormality of the second rib are vir. ocuming and to a



he a True from ra in flase. The tre 1 left numerian and for his secret. In 15 more leva ed and ha id or train to the small second on



F 3 Philograph fdf med hist lisee 1 be Case The peem off m be Then to fith ones as f 11 be lat the little 1 red Leu lieu little 1 red

le set d erec other skeletal malformation uch a chan e in the upper end of the sternum (Helm) cervicothoracic color i and deformits of the vertebrae. The two latter phenomena have been particularly site, sed by Wal he Jackson and Wyburn Mason

#### ETIOLOGY

Two cr dital! th one have been ad vanced to explain the 1 velopment of cervical ribs and maldevel 1 ment of the firt rib Accerding to Jone It i th nerve that are the d minant fa tor in haping the destine of the futur tib lik ause they devel pile fore the | L leton an l are the important factor in governing the arrang ment of the primitive body sement. In the onne ten he ha e intellout that the ubclavian errore in the trituli in reality from elly and lithe lowe t criof the ira hial plexu it i mi leadin t reard it a a grx of r the subcla van arters whi hie all s and in front of th neve Intal fth ս! ո clavase. In r htly arms that the d pre n hullbe allelth sul u n rvi H furth r tate that it i terms still a m that th < an ma ar tri liva! aritr ur a with the ne tunka he raira hial an lihat th rt lin these ases i a xtra i e-

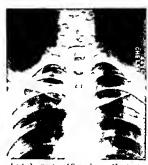




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as a rule by the inclusion of the econd thoracic nerve in the brachial plexus (Fig. 2) This has all o been emphasized by Hert sl t and keith and by Dow although the latter has pointed out that the rib may end at some distance lateral to the cro sing of the nerve. In those cales in which a seventh arvical rib i unusually well developed the first theracic nerve often fail to join the iluxus at least in its normal bulk and it is tribable that different degrees of develop ment of cervical ribs show the effects of varying contribution from that nerve Cer vical rils are therefore halk too cur with a prefixed type f brachial plexu while an mal u first ril are f und when the second the race nerve is an important com-I nent in ix terior fixution. Sarg nt. who has described absence of a first thoracie c ntributi n to the I rachial pl xu enc un tered in the course of resecting a cer a al rib su re te i that this anomaly i more common than a 1 tire I one Wal h and coll agues a ne that a rudim ntary tirst ril a n arls al awa sociat I vith a larg ntritution ( the end thoract ract to the leading

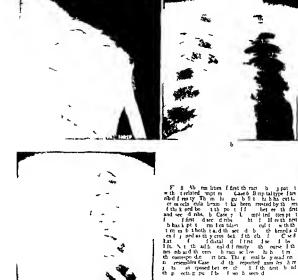


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plexus but state that an added cervical rib is not necessarily related to a prifited plexus Wingate Todd (6) add confirmatory evidence to this theory by finding that the



If 7 ray p f Case 5 Th fre t it it it is both mily long nod 1 es th rit t it it is explicitly from the first term of the first term of the first node of the



ulcu n rvi bra hialis is l~ learly ut or altorether about in kelet n with cervical ribs Thi, anatomit has a cepted Ion ss neuroembryol of al theory of rib malforma tion but believes that these errors in Lixhly segmentation cannot all be ascribed to the ingle cause. He ha advan d the addits hal importance of vascular infit nees and be

h ve that variati n in the arterial tree are prope to infly n e the d velopment of the upper ribs on the left ad In our example to be de cribed the fir t patient hall a pr tfixed brachial pl xus with a large ontrib ti n from e ord the race root and the tith patient had e e al tiking an mal s in subcla nan and carotid arteries on 1 it side

w th th

Neither of these theories can account for the occasional appearance of a bicipital rib below the first thoracic egment. In the Radiological Department of the Naval Hos pital there is a routine chest film in which the second rib ends at the midaxillary line and fuses with the third whose shaft is consider ably broadened at this point. This suggests that any of the upper ribs if they fail to reach the sternum tend to become attached to the rib below and by the resulting fusion form a bicipital rib

It is worthy of comment that with abnormal first ribs as is also the case with cervical ribs and the scalenus anticus syndromes symp toms are rarely encountered before the age of twenty. This has been explained by Iodd (66) in his account of the descent of the shoulder after birth Since the upper limb develops at the level of the seventh cervical segment the first and second thoracic nerves must first run upward until they have cro ed the uppermost rib and then angulate down ward to enter the arm Because of this arran ement any elevation of the rib or depression of the shoulder must stretch these lower connections with the brachial plexus Todd has shown that in the course of normal skeletal development there is a gradual de srent of the shoulder with advancing years This tendency is of course exaggerated when the individual carries any heavy weight and is reduced when the weight is taken off the arm by supporting the elbow in a sling or on the arm of a chair It is just these maneuvers which frequently result in exacerbation or relief of symptoms (see the clinical histories herein reported)

In addition to the disturbances caused by a con enitally deformed rib brachial neuralgia has been ascribed to pre sure irritation of the lowest roots of the brachial plexus by an apparently normal first thoracic rib Numerous examples of this condition have been de ernbed by Buzzard Bramwell and Dykes (5 6) Stiles Murphy Morley Stopford and Telford Wheeler and Brickner (7) Many of these patients were relieved by resection of portions of the first rib but all were reported p for to the classical paper of Adson and Coffee (2) which appeared in 19 7 and

brought out the rôle of the anterior scalene muscle in compression of the brachial plexus in the presence of a cervical rib. In view of Naffziger's (46) description of the anterior scalene syndrome in which brachial neuralgia is found in the presence of an apparently normal first rib it is our impre sion that the e cases were probably examples of this condition and would have been relieved with equal success by scalenotomy I few may bave even masqueraded as protrusions of lower cervical intervertebral discs which may easily be mis taken for the scalene syndrome and probably account for some of the failures of scaleno Wyburn Mason have claimed that com

tomy Very recently Walshe Jackson and pression of the brachial plexus and sub clavian artery may be produced by the clavicle as it approaches the first rib in ca es of extreme sagging of the houlder Granted that a significant deformity crists

at the thoracic outlet the on et of symptoms frequently depends on some form of trauma to the shoulder girdle \ large proportion of the reported cases of aromalous first or cervical ribs with I richial neuralgia or vas cular disturbances have occurred in service personnel soon after induction Many of these men who have been leading relatively sedentary lives first develop symptoms after

shoulder or following a sudden muscular Your out of our five cases with brachial neuralgia are in Naval personnel and one of them (Ca e 4) noticed the on et of his neuralgic pain following trauma

carrying a heavy pack or neight on the

#### SYMPTOMS PRODUCED BY MALFORMATIONS OF FIRST RIB

Symptoms and igns produced by con genital deformities of the first rib fall into three main groups

I Local The e include bony projections in the supraclavicular fo sa which can be felt and sometimes seen. Often the subclavian artery lies in an abnormally high position in the neck and semetimes its bulsations are viable bereath the Lin The bony deformity is often a cause of vascular or reuralgic symptoms when the rib ends at the scalene tubercle which is unfortunately the

mo t common arrangement. Here n may form a synosto is or pseudarthrosis with the second rib and its termination may be expanded by a prominent capsule. More rarely it continues as a band of fibrous tissue to its normal attachment with the steraum or ends as a bony tip in the soft it sues. In an unusual complication described by Henry, the harp free end of the rib was a cause of intermittent pneumothora.

Lascular Circulation in the arm is often reduced. This may be apparent at a glance when the hand is discolored and very cold particularly if trophic disturbances are present. The radial pulse may be absent but often it is necessary to compare the blood pressure in both arms while downward traction is made on the affected side or the patient rotates his chin in this direction throws his shoulders back and takes a deep breath (Adson and Allen 1) Brickner and Milch and also Walshe and colleagues have reported cases with an arterial bruit. Reduced circulation in the arm ha been asembed by Todd (63) Stopford and Telford and Wilson to the irritation of sympathetic fibers in the lowest cord of the plexus Walshe and his colleagues have de cribed a patient with an associated Homer's sign and loss of sweating of the right face need and upper extremity. As these observers pointed out it is obvious that the rudimentary first thoracie rib in this case must have produced a sympathetic paralysis not of peripheral origin from compre sion of the plexus but from mury in the region of the cervicothoracic gan lion which carries sympathetic hbers destined for the head as well as the upper extremity To account for the common reduction of circulation seen in the arm one would have to as ume an irritative action on the sympathetic axones in the brachial plexus which should be accompanied by hyperhidrosis and possibly pilomotor disturhance in addition to vasoconstriction Neither we not any other writers have observed these manife tations with either cervical or abnor mal first thoracic ribs Furtherrore as Sir Thomas Lewis (3) has hown neurogenic con triction of the arteries is ne er suffi ciently intense to obliterate their pulsations

In short as Walshe and colleagues have summed up the argument it seems clear that the re are no grounds upon which we can reconcile coldness evanosis pallor and tin gling of the hands with involvement of sym pathetic fibers and that there are many grounds upon which we must relate them to compre sion of the subclavian artery this is severe and long continued intimal chan as may occur and result in local or wide pread thrombosis. This has been de cribed in first rib anomalies by Russel Bruett Le mure Lindgren Adson and Allen (1) and Walshe and his co authors Amon clinical histories of the peripheral circulators clinic and the private wards of the Ma 4 achusetts General Ho pital there are 2 cases of cervical rib in which thrombi appear to have broken off and caused emboli to lodge in the brachial and di ital arteries 1 Lewi and Pickering (39) and Walshe and colleagues have recorded similar complications may well have been the case in Lindgrens patient with an anomalous first rib and subclavian aneurysm at this point as the brachial arters was occluded in the mid upper arm Venous con estion and the formation of collateral channel from compression of the subclavian vein by a normal first rib has been reported by McLaughlin and Popma and by Sampson Saunders and Capp The presence of a malformation in the first rib might well be present in this condition and should be sought for although to our knowledge no instance has yet been reported. This may be explamed by the fact that most anomalous first ribs are rudimentary and end at the scalene tubercle before the point of cros ing of the

3 New alaptical Local tendernees on pressure over the prominent rib behind the clavide with at times radiation of pain down the arm are feque tly present Sometimes the plexus can be rolled over the underlyindony prominence and tingling paresthesias produced in this way (Lave 5) Numbre 5

subclavian vein

In the E parties of D. Herr. If F parties provided provided provided by bread all parties provided by the provided provi

may be present in the more severe cales or when the houlder is drawn down by lifting a heavy weight. Such sensory changes may be only subjective. When objective protoathic sensibility is more likely to be reduced than coucritic (Wilson) It has seemed to us that in the e cases the pain is not as likely to be limited to the distribution of the ulnar nerve as in the case of cervical rib or scalene compression. This however is not always true as cases of cervical rib have been reported by Descrine and Wilson in which pain was referred to the lateral side of the han! Swank and Simeone have reported a number of instances of the anterior scakne syndrome in which pain referred to the upper plexus distribution was relieved by The most complete descrip scalenotomy tion of neurological changes in the arm due to an abnormal rib has been given by Linnier Wilson He pointed out that the neuralgic pain paresthesias and muscular we kness may be limited to the ulnar area or involve the thenar eminence and radial side of the hand and forearm To account for this he has pointed out that the medial head of the median and the ulnar nerves have a common on in from the eighth cervical and first thoracie pinal nerve roots. Wal he and colleagues have stated that nerve compres ion like arterial need not be produced at the sulcus nervi brachialis. If it occurs more peripherally as when the classicle squeezes down on the deformed first rib other portions of the sen ory and motor outflow to the arm my be involved. In addition to the sensory manife tations motor weaknes with wide preal to s of power in the arm may be pres ent and atrophy of the arm and intrin ie han I mu cles has also been reported in no wise different from the paralyses cen with cervical ribs. Loss or reduction of reflexes is an a lditional sign. The reduction in motor power may be secondary to impaired eireu lation as well as to direct paralysis of motor nerve fibers (Lindgren and our Case 1)

We have been unable to differentiate con genital almormalitis of the first rib from certi almb or centure in the the anterior calene muscle on the built clinical symp thm or physical upon almo. A similar conclusion has been reached by Walshe and colleagues The sen ory disturbances may be somewhat more widely distributed in the former condition but this is not definite enough to be counted on Even with an ordi nary anteroposterior wray picture of the cervicothoracie pine bilateral malformation of the first thoragic ribs can easily be mistaken for cervical ribs as the mandible hides the upper cervical vertebrae and it is not possible to count down from the atlas to identify the first thoracic segment A lateral film is not too helpful because it is often difficult to defire the exact vertebra to which the uppermost rib is attached. It is essential to be able to out line all the vertebrae in the neck and upper thorax on an anteroposterior film which shows the details of the upper rib articulations as well This can be accomplished by making a long exposure with the patient opening and closing his mouth. In this way the hadow of the mandible is blurred so that it does not ol scure the outlines of the atlas and axis vertebrae Anteroposterior v ray films should include the whole of the econd as well as the first rib as the anomaly often involves the All of the bony structures bounding the thoracic apex require careful scrutiny. In unusual ca es it may be advisable to include the entire pine so that the total number of ribs and lumbar vertebrae can be counted Unle s these precautions are observed first rib deformities will be mis ed. After an exami nation of skingrams reproduced in many articles which purport to illustrate typical cervical ribs we as well as Wal he and his colleagues have been impressed at finding that some have been misdiagnosed even by roentgenographers and actually represent malformations of the first thoracic rib

While the presence of a malformation of the uppermost rib can often be diagno ed by the clinical evidence of a mass with compression of the brachial plexus or subclavian artery and its vertebral ongan determined by reent genography it is still important to make certain that it is the actual cause of the symptom. Offer cenditions which can give rise to meanly identical crip plants are neeply mis of the superior pulmonary sulcus (44) cervical arthritis, and I crimits in of one of it le lower arthritis and I crimits in of one of it le lower

cervical intervertebral discs. While such diagnostic errors could not be made in the presence of a large first rib deformity with evidence of postural arteral compresson a concomitant disc hermation could easily be missed in the presence of a rudimentary first r cervical rib and symptoms limited to neuritic manifestations. This complication could have been present in our Case 2 in which coughing neezing and turning of the head caused pain to radiate to the houlder and arm. Under these circumstances lumbar puncture should always be performed and in addition a myelogram with opaque oil if the cerebro pinal fluid protein is elevated.

# PERSONAL CASES

Our experience with malformations of the first thoracte rib comprises 10 cases of whom required surgical intervention for relief of neuralgia with superimposed thrombosis of the subclavian artery in the first patient. The other a had no pecific complaints and were discovered in the routine examinations of thoracte v ray films made for other conditions The case histories of the patients upon whom operations were performed are given in detail below Of the asymptomatic group roent genograms of , which illustrate interesting variations of this anomaly are reproduced in Figure 8 The remaining 2 who had deformities recembling those already described are merely mentioned for statistical purposes

CASE! Mis Hile T editionals Cognitial malformation finish and second ribs on left with impress n of brach all pleaus ind subclaimatery. Post n r fixed in fibrach 1 pl sur Miprot in a fater scalent try but good result il wing a btotal resect in firbs and pregang I one yimp theet my

Fo months p o to be first admiss on to the Massa huests for nall p to all these man inted a ms of n mb es in the fin ers 1 h. It had distributed by the constraints of the conditions of the con

at first w r ommal Blood per u read gave; a jobo on the neight 124/85 on the left Wanter perature measu ements brought out a red et bed az d grees F in the left thurby and small freg a d I idegrees in the middle finger ( troom temperature of 85 degrees; es; Ergometer te tiss he el arry of o kilo-rams in the 1ght hand 60 in the littler gen rall physical e am it on was not otherwase remarkabl xept if robestly Vinyim bed unform atchy wer destroyed at the end of a 5) rancerval wer; at first 1 terptet d as a hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d as hw g binnerval wer; at first 1 terptet d

ture was normal Oct br 3 1930 exploration of ab ormal first mb 2 d div 1 n of left ant ror scalene muscle er carried out After careful di section a dipali at it was ev d nt that the anter; r scalen muscl wa unusually t use When cut across its ends r tracted widely and we felt that it account d at I ast in part for the irr tat on of the brachial pleaus There was no defin to evidence howeve that the subcla ian artery was compressed. The artery unusually promin at a d looped a ound the lat rel edg of the musch but it pulsated n rmal y d form ty in the ribs was f u d to cons st fal ig p ends throsis with a thicke ed capsule where th underdeveloped first r b joi ed a hypertroph is cond rib just beneath the point whire it crossed by the aftery and neme trunks. As the myotomy seemed to have rel ed all pessu o these structures no effort wa made t remov the t b deform ty This pr ed to b an error as lat f d elopments brought out

Convalesc nce w s u es ntíul On re-e m 4 ton 6 weeks lat r she had os bject e e mpla t but the e was a small subu gual abscess ; b | it thed finger All the fi gers o the lit remand and the color of this hand d tinctly darker than the right When next s en on February 20 to: she had no complant but by th f ll sutumn b r riginal s bi ct ve sympt ms had it turned In add t on t the temperature a d color changes un her left hand the r dial pulse had disppea ed a d blood p es u e readings were b my btsmable from the brachial rt ry She was th ! foe dvis d to eturn t the hospital a d w s readmitted on October 22 194 At this time h f paus was not see as o he pr vious admis wa nly a d ll che ) but sh c mplamed f a distu bing numb ess nd waknes especially al t w king Agan the rumbress wa p ly a subblood pres re lects e sensat but o nulsat ns d ngs co ld be blained in he left arm Tests to d t rm n the rat of m cula fat rue (comptess l ergom t t 3 k m 36 times a m ate) howed that contraction of the left had could be co t

f ronly i mi ute d s co ds bef re theo set !

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se ere pain 1 the muscles of the f rearm wh reas sum lare ercuse could be kept up 1 the n rmal 2 gibhand for 5 minutes and 5 econds after which there was liability to do further work but no actual pain When a tournquet was applied to the night arm fair we and pain occurred in 2 minute and 35 seconds

October as 1910 Diagnost e paravertebral procume block of the upper thorace ganglia in the runner originally advocated by one of us (J C V 12) resulted in a dramate uner see in temperature to the normal vasodilat t on level but no return of the rad alpulse Her abid ty to fix per fingers at a constant rate against a g ven resista ee was then compared with previous transa Vilhough the; creased blood flow did not augm the capact by with the outself fat g in olonger brought on the

painf I claud cation October 29 1910 subtotal e cision of the left first and second ribs a d pregangle c sympathec tomy under intratracheal ether anesthesia w re done Exposure was facilitated by a wide semi circular inc on with lateral retraction f the scapula. In addition t a subtotal resection of the fu ed first and second ribs the central portion of the third rih was removed to obta n the most effecti e e posure for a preganglionic symfathet e denerva tion of the arm (73) I the course of the sympathee t my it as f u d that the patie t also hal a posterior fi at n of the brachial ple us with I rge second thoracic nerve which ran upward t join the plexus We were the fore unshie to cary ut th usual resect on of the roots of the seco d spin ! nerve but had to content oursel es with a car ful resection of its symp that c ram hich co

it with the second thorsace sympath te gs pli n Whole in her ray films are n | gr a 2 lable a good idea of this unusual m Horm t n can b bter of from Figure 3 a photograph f the poc men temored at operation It is evid t that we were temored at operation It is evid t that we were about 10 less the second mb | med b' an about mally mall feet the condition of the c sto vertebral articulation

When I st seen 17 days after this operat n the paid to had no pain; her arm or hand n naft r ctive movements and ergometer tests. Her left hand remained normal in color and distinctly warmer than the normal extremity, alth ugh there had been no ret in of the radial pull.

Case a D add II age 23 years WT /c USS.

Conge stainfalde et pm to first thou fit which for ed with second causing irrit ton I brachial ple us Fart affreit followings to reseal in timy. This was the second prode figuring it read in timy. This was the second prode figuring it is read a to the bid trand d with the milit is ded to Uth for the case the things with the pain was it were his neck became stiff a dipainf information coughing and several ghart. He had discovered that in dir these circumstances he was most count rather layer.

atra ght and we ght off his arm. The present attack had started 6 e ks prot i his admiss in an I had again partially cleared. Eight in months previously he had de loped styphils but after a full to resolgantiletic treatm in the kahn reaction and sign I find examination were normal. If in physical examination were normal ting physical examination was not remarkable except for the findig of distinct supracta redular tenderness over the insertion of the left antenor scalene muscle with a distinct plug in this area. The subclavian arters was more priminent on the side than on the right lilood pressure read ngs were the same in both arms and it as impossible to shut off his radial pulse by any maneure. Although neck movements had forme by been painful they were free at the time of this examp ration.

The x ray picture reproduced in Figure 4 ds closed a rudimentary first r b which joined the second 334 cent meters lateral to its articulat n

with the trans erse process

Os g to the local tenderness at the origin of the scalenus ant cus it seemed more logical to explore antenorly altho gh total resect on of the rib would have required a posterior ineis on

On April 12 1914 supraelavicular esploration and anteno scale tomy were do e. There was con siderable fibrosis around th. I were end of the scale which was mainly inserted into the second of the subclavian artery and lower port on 1 the plerus were compressed between the lateral border of the muscle and the end of the rudimentary first results.

Mere a smooth convalencence with early phy ocherapy and we maning he was discharged to duty after a weeks. He ret med f r a check up after a, me to pen de sea duty complaining of intermit t to bouts. I less as e e e discomfort i ha left hudder. These were not continuous a din t very capacitat g. On being offered the ch. c between a trial of I me dishore duty or react in of the rud me tary first rib he chose the first alternative a he d a not feel that he had sufficient d scomfort to require further surgery.

CASE 3. George R. aged 30 years 5.2/c USN.

B lateral congenital an males of first ribs with cerveal a d brachial neuralina and partial compension of 1st subclavian artery. Postoperative return of left's ded pain due t incomplete r moval of rib with read allown you. Two stage remival of b stumps foll ed by priggs employement.

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tors Just posterior to the clas cle and extend go back toward its vertebral articular the b was ele sted and unusually pr min in It as majors this to shut off the radial pulse by any me caver but pressure a m is the bony promine ce produced to gling paretthes a in the ultiar's le of the h n! The were ne then objective sensory nor motor

paralyses

The x ray picture repr duced in Figure standard a most unusual defo mity on this 3 de which the first rib arose at a very obtuse a gle and ran nearly in a stra ght line for 7 cent meters from its transverse process. Here at a point just behind the clavide it ended in a distinct j. i. B. I with standard the distinct of the

o g see foregoing)

On March 10 1045 the supract out of saa as wedly e posed by a trans ree inc figer s be dtb bo e the clavicle which extend d from the clavicular insert n f the stenocl dom t d muscle and curved pward to the anterio botde f the trapezous. The phre c ner e t getb la ge accessory trunk w s r tracted medially a d th aned-out insertion of the ant rior cal em cle livided After a w de exposure h d b sec red the bo y anomaly arteries nd nerve t hs t the b e of the eck were carefully amin d It was th a appare t that the posterior portion f the first b came fi at an u ususlly obtu e a gle the po t of ma m m prominence ; st b h nd the cl icle II re the palpable bony mas was f u dt on ist fa pae darthross with cart lage coered bone end but v ry lmt d mobility. The port on I the rib anter rt the ran obling ly do sneard beneath the class lt j the seco d rib. The c rds of the brach al plexus I y d ctly ov r the projects g articulation so that they w pr ssed a danguisted by the u d rly ng bon this point the sp ce between the first ib and the cl icle was gre tly n rrowed so that th Walsh Jackson and Wyb rn VI son theory of cla cul compres n may will ha plyd mport t role The e were the a cular an mles al g left mnom nate artery which ga e n t the s h lavian and common car til hich trug e off the int mal mamm ry ni transverse rieries a dan i f rior thyr id wh ch ar ry cal sabelasian s veral cent m ters I teral t its s al ont of men to transverse scapular art ry co ld be seen. By careful ma pulation the brachs t freeing up a d cutting the rib 3 e nt m ters beh d its po t f cute a gul tion (st th med al scale ) It was th mr! ert mrt mattere f ee th stischments IS been fa t and imp we th

pleurs. The nb anter, rily was then ro geure I away to the pseudarthrosts wher it disappeared be eath the clavacle. When this had be encomplete list for ward end dropped down leavin the small distal stump will clear of the pleurs and co er d with a smooth 1 yer of cartiage. A rubber dam drain was left in the exte sive dead space from which the section of nb was removed.

Bey d some tingl g paresthesias which were present for a few days there were no sequelae to this e tens ie man pulation heneath the ple us. The dra was rem ved the day follow g operation and the inc s on healed uneventibilly. At the present mome t 6 weeks after the operation he is nearly

free of bis former symptoms

The symptoms of mechanical irritation of the brachial plexus and compression of the subclavian artery caused by a congenital mal formation of the first rib are exemplified by the 5 cases here reported To illustrate some further variations of these abnormal ribs the x ray films of 3 additional cases are reproduced in ligure 8 These together with imilir deformities in 2 other examples were the cause of no symptoms whatever but were nicked up by one of us (MHP) in the course of routine examinations of chest films. This series of 10 includes all the common mani festations of this deformity which we have been able to find in published case reports Of the concomitant malformations cervice thoracic scoliosis was pre-ent in 3 (Cases 3

and 8) while deformities of the second rib occurred in every instance. Of the more rare complications which have been reported aneurysmal expansion of the subclavian artery venous congestion vertebral anom alies Horner's syndrome from sympathetic paralysis and spontaneous pneumotherax have not been encountered. That these deformities have been found in 9 males to a ingle female is without significance as all but one were in Naval personnel. In Case 3 the deformity was bilateral but in all 5 patients with actual neuralgia the first rib on the left was the cause of the predominant symptoms this again is probably of no statistical light ficance as in other reported cases the in i dence has been approximately equal on the two ides Orset of symptoms following definite trauma occurred only in Case 4

It is worths of comment that we have on untered only a single malformation of th

first rib in a civilian during the past V years and that the others have all been in U S Naval personnel In the first half of the series our attention was directed to the con dition by neuralgic pain. Four of these deformed rib were in sailors seen during the 11 months period ending in March 101, As has so often been the case with other new medical syndromes as soon as the condition has been recognized and the attention of a large clinic focused upon it new examples are then found with increasing frequency Within the past 2 months 5 additional asymptomatic cases have been discovered. We are convinced therefore that anomalies of the first thoracic rib are no greater ranty than cervical ribs. Their presence should be sought for by roentgenologists and their symptomatology recognized by surreons and orthopedi ts

A summary of the type of symptoms and some found in our patients follows. Supra clavicular tenderness was noted in all but r supraclavicular bony projection in all. As to sensory disturbances neuralgic pain was noted in all subjective enterpheses in 4 of pertive ensory loss in only 1 of motor paralyses muscular weakness was noted in 3 muscular atrophy in 1 reflex changes in 2 \(\frac{1}{2}\) to vascular changes the subclavian artery was prominent in all arterial compres ion in

but there was found no venous compression no irritation or paralysis of sympathetic fibers

As to pain distribution in Case 1 diffu e pain was noted in the fingers and hand in Case 2 pain was noted in shoulder arm and second to fifth fingers in Case 3 in occiput neck houlder medial forearm and third to fifth fingers in Case a in shoulder arm and radial side of hand in Case 5 in occiput neck houlder breeps elbow and ulnar side of hand This summary bows that the neural gia from an abnormal first rib is unu ually widespread It was limited to the ulnar side of the hand in only 2 cases including also the shoulder and upper arm in 4 and the neck and occipital region in How the cervical pleaus can be involved is not known

Motor weaknes also seems to be rather diffuse. It was not limited to the lowest trank of the brachial plexus and was not accompa-

med by atrophy of the intrinsic mu cl s of the band which are innervated by the ulnar rerie Although the subclavian artery was forced upward by the underlying abnormal rib in all the 5 patients evidence of actual arterial compression was present in only 2. In Case 2 there was a shout postural occlusion of the radial pulse but in Case 1 the postural factor was at first pronounced and was later followed by thrombosis of the brachial artery None of these patients had any evidence of sympa thetic irritation or paralysis. In (a c i sympathectomy restored an excellent blood flow by dilating the collateral channel although the thrombosed arteries remained occluded

Viild cases of neuralma due to a congenital deformity of the first rih may re pond t orthopedic measures as is often the case in th scalene syndrome (\affziger and Grant 4.) These consist of improvement in po ture exercises to strengthen the trapezius and the other mu cles which elevate the should r gardle and temporary support of the upper extremity by a sling arm of a chair or the recumbent position. Reichert has also de cribed an arrangement of three pillows so that when the patient lies on his back the shoul ders head and neck are forced forward. In the lateral position with the shoulder on the mattrees between the two under pillows and the head on the third or top pillow this ar rangement prevents lateral flexion or rotation of the cervical spine and thereby reduces compression of the plexus In 4 of our 5 cases the bony deformity was such a definite cause of mechanical irritation that conservative measures did not appear to be worth a trial Case 1 was referred to the orth pedic service but postural exercises proved ineffective period of conservative treatment might have been worth a trial in Case 2 where a second attack of brachial neuralgia was subsiding pontareously but owing to the extencies of a very active m litary ho pital surmeal ex ploration of the rudimentary ril and scalene myotomy were preferred. Foll wing thi review of the literature and personal ex perience with these cases it i our jini n that an ar mal us first th ra rı! to produce me e severe mechanial

than is a cervical rib. This is because cervical ribs are so often more rudimentary structures whereas anomalous first ribs are commonly longer and associated with greater deformi ties of the thoracic outlet (70) Advocates of treating cervical ribs by scalenotomy such as Adson and Coffey ( ) and Patterson agree that when the anomalous rib extends forward to compress the brachial plexus and subclavian vessels it should be resected. This is generally the case with malformations of the first rib As already mentioned Walshe and his colleagues have accounted for the frequent failure of scalenotomy in the relief of compressive symptoms on the basis of the mechan ical role played by the clavicle. They have stated that the clavicle probably plays a lar more significant role in the production of pressure symptoms in the presence of abnormal ribs than is commonly realized This is particularly true in vascular distur bances where the clavicle and rib together constitute what we may call the vice in which the third part of the subclavian artery i re currently gripped. This may well account for intermittent postural compression of the artery ancurysmal dilatation and throm bosis or embolism. Such a mechanism mas well explain the primary reduction in Hood flow through the brachial tree and the final thrombo i seen in our fir t case. Here we were unable to determine the compressive rôle of the clavicle becau e we removed the l cipital rib through a posterior incision In our fifth case however there was a definite vise like compres ion of the plexus between the prominent jointed deformity of the fir t thotacic rib and the clavicle which was released by resecting this portion of the rib Interior scalenotomy alone was perfermed in our first two subjects followed by only brief benefit in the first and la ting but not com plete relief in the second where the rib was unusually rudimentary

On the bat. of our experience we plan in tuture cases to adopt the following policy. If the pat in fail to obtain satisfactory relief from conservative orth pedic measures exploration should first be performed through a supradavicular inci ion. Maximum exposure of the int can be of taued if the bits al

end of the incision is curved upward a short distance along the anterior border of the tranezous. The descending branches of the third and fourth cervical nerves which cross the incision should be carefully preserved The deep dissection should be extensive enough to permit a thorough examination of the brachial plexus with its accompanying blood vessels to the point where they cross over the rib in the subclavian groove. If the almormal first rib is so rudimentary that it is hidden behind the middle scalene and can cause no mechanical irritation of the blood vessels and nerves the procedure may be limited to division of the lower end of the anterior scalene muscle above its anomalous insertion into the second rib. Such a rudi mentary first thoracic rib will rarely be found In the more common deformities where the first rib articulates with or fuses with the second at the scalene tubercle or continues forward as a prominent bony or ligamentous structure the anterior scalene must be divided and the abnormal rib excised from a point beneath the elavicle back to its disappearance in the posterior muscles of the neck central to the insertion of the scalenus medius Every effort must be made to leave no bony pur projecting from the superior surface of the second rib as this i nearly certain to be a source of continued nerve irritation (Ca es 3 and 4) A residual posterior stump over a centimeter in length is also likely to result in further trouble This resection is more difficult than removing a cervical rib for the reason that the first rib is so much more deeply situated. It is therefore important that these operations should be carried out under intratracheal anesthesia and that care be taken to avoid perforation of the pleura injury to anomalous blood vessels or the thoracic duct (Barnes) or undue retraction of the brachial plexus. When the supraclay scular operation has been properly performed there should be no need for a second stage posterior removal of the central tump of the rib This was nece sary in our first patient because we had mi judged the reed for re section of the deformed rib when the anterior scalene was cut In Cases 3 and 4 the amount of rib re ected at other ho pital was totally

in dequite. We feel that after a previous incomplete r moval of the upper rib from in front its remaining central stump can best be exposed and removed from behind through the inci, on de cribed h. White Sinthwick Allen and Mixter (,4). Wherever the cause of mechanical irritation has been radically removed the re ults have been satisfactory.

#### SLMMARY

1 Mthough congenital anomalies of the first thoracic rib are not extremely rare their clinical manifestations are le's well known than those produced by cervical ribs

2 I ret rib malformations generally con sit of a rudimentary, structure terminating in a synosto is or pseudarthrosis with the second rib near the calene tubercle or in a free end in the off tissues at the base of the neck which may be connected by a ligamentous band with the manubrium stern. On very rare occasions the first rib may have a dis tinct joint near its lateral angle before it fuses with the second.

3 Other skeletal abnormalities are fre quently present which cause further distortion of the thoracic outlet. They complete of deformities of the second rib the upper end of the sternum scolo is of the cervacethoracic

spine and vertebral anomalies

<sup>4</sup> 4 Congental malformations of first tho racic ribs as is true to a lesser extent of cervical ribs are best explained by errors of bodily egimentation in early embryonic development. These are brought about by abnormal formation of the brachial plexus and blood vessels which make their appearance before the bom skeleton. Examples of posterior fixation of the brachial plexus and abnormalities in the arranevement of the arteries at the thoracic outlet were encountered in 2 of our cross.

Symptoms and chrical exile cc of abnormal first ribs ones to of upraclasticular bony prominence irritation or paralyst of the brachial plexus and compression of the subclassian yeasel, as they cross the defective rib

6 Cervical arthritis early carcinoma of the thoracic apex and herniation of the lower cervical intervertebral discs must be considered in the differential diagnosis of bra

chial neuralma even in the preserve of a anomalous rib Malformations of the test thoracic cannot be differentiated clinically from cervical ribs. They can be accurately diagnosed in an anteropo terior viras nicture which includes all the cervical and uppermost thoracic vertebrae provided the film is taken with a long exposure and the mandible in motion. Under these circum tances the o t hae of the mandible will be blurred and the vertebra to which the uppermot rib is at tached can be identified by counting down ward from the base of the skull (areful crutiny should also be made to detect a sociated abnormalities of the second ribs ar i deformities of any of the other bony structures of the thoracic arex

1 considerable proportion of fir t rib deformities are large enough to cause direct mechanical compression of the nerves and vessel at the thoracic outlet. When symptoms are attributable to the condition conservative orthopedic measures should be tried before surgical intervention. Scalero tomy alone rarely suffices to decompres these structures but must usually be accompanied by radical resection of the rib from a point close to its articulation with the trans verse proce a forward to its attachment to the second rib or where it disappears beneath the clavicle. In cases in which an incomplete re moval has been performed through the an terior supraclavicular approach the central end of the rib may till cau e irritation of the plexus Resection of such a stump is then best accomplished through the posters r approach

8 Our series of malformations of the first thorace rib in wompries to cases. Fixe of these which required urgical intervention for relief of symptoms are de cribed in detail. We have also reproduced the films from 3 of 5 other asymptomatic cases di coxered in the ourse of radii logical examination for their conditions.

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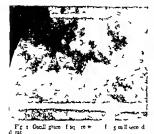
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re pective of the time interval between stimuli. With this apparatus we are able to obtain an impulse of rectangular wave shape lasting for as short an interval as 30 microseconds or as long as de red (Fi 1). Thirty, three different time interval selected to conform to a log arithmic scale were made available. They ranged from period a long as 2 second to one as short as 30 microseconds. The duration of the impulse when measurement of galvanic tetanus was desired wa 2 second.

The material consisted of 5 cats in 8 bick section and immediate uture of the sciatic nerve were performed and 6 animal in which after a long segment of the catic nerve as removed the proximal stump was mycted with alcohol to di courage regeneration. In addition, many other animals used for other cyeriments were examined by the method.

The rheobase was determined by in in the threshold value of current when the impulse lasted one second. Then threshold value of current for the production of testam were found when an impulse lasting two seconds was used. By shuntime the pecturent out of the circuit it was possible to observe the am perare in a suitable milliammeter. As much time is was nece sart was used and painful unbearable stimuli and severe polarization chain is were avoided.

To obtain comparable re ults it i rece sary to examine each muscle by timulation with an impulse of the same duration. The choice of the impulse lasting 2 s cond v as marke la cause during denervation the contraction of the muscle is slow and impulses of shorter duration produce contraction the plateau of which lasts too short a time for accurate v. and observation. The enterion of tetaniss was a plateau representing continued contraction throughout the time of the impulse with very little relaxation—in other word—a tetanis for the duration of the impulse.

#### RESULTS

In the examination for galvanic tetanus one obtains two cets of data. The first 1 the choose or threshold current for instantaneous immulus of infinite duration using both anodal and cathodal closine timble second the threshold amperage at which tetanus is produced and sustained lot the duration of the stimulation impulse both for anodal and cathodal stamul. From these procedures one obtains the tetanus ratio by dividing the rheba ic current into the threshold current lottetanus. The data obtained may be interpreted from standpoint of changes in rhoolase in threshold current for tetanus and tetanus ratio.

#### THE RHEOB ISE

The liminal current necessary for effective cathodal closing stimulu in the normal musel of the cat ranges from 0.45 to 1 milliampere

A small initial rise in rheobase occurred at varying days usually from 6 to 14 after sec tion and suture of a nerve and continued for a short time usually a few days. Meet 2 weeks or little more the threshold for sumulus di mini hed and the muscle appeared hyperiri table to direct current stimuli of infinite liter the third week the median value of liminal current neces ary for effective stimulus of gastroenimius or tibiali anticus is nell below the normal rheolase value and is close to o milliampere. Although below the normal rheobase value unipolar stimulation required more amperage for adequate stimu lus. Thus regardless of polarity the liminal current neressary to timulate mu cle after the third week is significantly less than the normal throbase

Following this initial period the muscle be comes completely lenervated. Throughout this time the liminal current necessary for ad equate stimulus is very small for bipolar stimulation it may be as low as o 1 milliampere and for unipolar stimulation as low as 0 3 mil lumpere When after section regeneration was di couraged by injecting the severed ends (fa nerve with absolute alcohol this hyperir rital le state continued for 346 days and the theobase was 0.2 milliampere for cathodal and also o 2 milliampere for anodal closing stimulus. Thus it may be said that the ratio between the threshold milliamperage for ano dal and cathodal closing stimuli is at unity

Forty or 50 days after primary suture there is a gradual more often a sudden increa e in the effective current and after the 6 th day the current may have doubled or trebled its previous value. Unipolar stimulation accentuates this change Between the 40th and 30th day the average liminal median current in an other series of animals was 1 8 milliamperes at the both to 65th day it suddenly rose to 4 miliamperes After this day in many instan res contraction did not occur even at 5 milli amperes Higher values of current result in so much spread to adjacent muscles as to make the examination equivocal

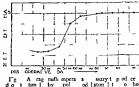
Soon after or at a time coincident with the sudden increase of liminal amperage chinical sions of recovery may be found. The liminal amperage remains high long after recovery of motion and sensation. It begins to diminish significantly at 1 o days but still remains higher than normal rhoobase after 240 days

We have confirmed in man the changes here described in the cat. The normal rheobase in man varies as to the muscle examined for fl xor sublimis digitorum it is about i 2 milli amperes for the tibiali anticus 6 milliamperes

During a state of denervation the order of liminal amperage is about one lialf of the nor mal rheobase As neurotization occurs and recovery progresses the necessary amperage may rise from 11 to 40 milliampares or more (F1 2)

#### UITANCES IN THRESHOLD AMPERAGE AND IN TETANIS RATIO

During the early part of d generation after evere injury to a nerve and during a long pe ri d of time during regeneration after denerva



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tion changes in the threshold for galvanic tetanus resemble those for denervation each there is a rise more marked during the state of regeneration. During the state of denervation the threshold is at its minimum

After section of a nerve the threshold am perage for galvanic tetanus rises shortly thereafter at 6 days it rises consider ably at a later period after 14 days it rises to a lesser dearce. The reak of this rise is found to occur at from the 6th to the 8th day after which it begins to dimini h from the 21st to the 15th day until the state of denervation is reached. The average thre hold amperage for tetanus at its peak is 3 9 milliamperes for cath odal closing stimulus with a range of from 1 4 to 5 milliamperes-an average of 5 82 mills amperes for anodal closing stimulus with a range of from 3 to 10 milliamperes

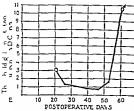
During the state of denervation the thresh old amperage is at its lowest reaching this point at an average of 42 days with a range of from 37 to 40 days and the polar ratio approaches unit v

At the peak of regeneration the average threshold amperage is over 14 8 milliamperes for cathodal closing stimulus with a range of from 2 to 7 milliamperes and over 13 7 mil hamperes for anodal closing stimulus with a range of from 3 8 to 27 milliamperes

The threshold amperage begins to rise from its minimal value during the tate of denerva tion at from 4 to 55 days after suture and reaches its peak in from 52 to 65 days (Fig. 3)

#### THE CITANGES IN TETANIS RATIO

As is the case with thre hold amparage so with tetanus ratio the changes during some



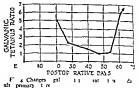
ig 3 Changes thresh ld m lh mperage f gal am t lan d it prim re t re

lart of degeneration and throughout regeneration are similar and consist of a much greater see in the ratio during the period of regeneration. During denervation the ratio is at its minimum often at unity, both in the case of anodal and cathodal closing stimult.

Beginning at the same time after suture as rise in threshold and reaching its peak at the same time the average tetanus ratio during the process of degeneration is \$7 for cathodal closing stimulus with a range of from 3 to the angle of form 3 to the angle of from 5 to the angle of from 5 to the same of from 5 to 1.

During denervation the ratio is at its lowest often reaching unity The average ratio for cath odal closing stimulus is 1 56 with a ran e of from 1 to 3 and for anodal closin, stimulus 1 S with a range of from 1 to 1 S There is no doubt in our minds that at some time during denervation unity is reached in every case both for anodal and cathodal closing stimuli This indeed was true of all animal which were denervated and the unity persisted for over 100 days. After a suture, when regeneration is proceeding the exact time at which complete denervation may be present for a few days before neurotization occurs may rot coincide with the time an electrical examina tion is made

During the regeneration the peak of the average of the tetanus ratio was our 13 in the case of cathodal closin is imidi and over 13 for a hodal closin in timuli. Pecalle at the same time the rheobase was ele ated it was



often imposible to obtain tetanus with amounts of current which the animal would tolerate without tumultuous struggling. The range of the average of the peak of tetanus ratio was from 3 to over 40 in the case of rath odal closing stimulus and 4 to over 40 in the case of anodal closing stimulus (Fi. 4).

During the period of degeneration there is an initial rise in the rheobase thre hold am perage for tetanus and tetanus ratio. The rise in theobase is small that of the threshold amperage for tetanus is usually moderate and there is a large increase in tetanus ratio These increases are followed by a fall in all un til the state of d nervation occurs and then the rheobase is at its minimum as is the thresh old ampurage for tetanus. The tetanus ratio approaches unity and finally if regeneration not too rapid reaches it both in the case of anodal and cathocal stimuli With the on-et of remeneration there is a larger ri e in rheobase in threshold amperage for tetanus and a very large frequently in leterminable rise in tetanus ratio

The chance in threshold amperage for tet anus and of tetanus ratio are the same as the chan es of thre hild lamparate for contraction with progres we currents and of ratio of contraction with progressive currents. In the prevent experiment we have examined the animal both hypotressive currents of londuration and for galvanic tratians. The changes revealed by these two method of examinatin n were compared and found to be similar. These has its may be quickly villa lized in Table 1. They may also be seen in a repair to the contraction of the

TABLE 1 - RESULTS OF FLAMINATIONS

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change in the threshold current for galvanic tetanus and tetanus ratio at varying days after primary suture (Fig. 5)

In a number of peripheral nerve injuries in an an enave confirmed the approach to unity of the tetanus ratio during denervation and its marked rise during regeneration. Moreover in these cases the data derived from examination with stimuli by progressive currents of long duration parallel the changes in tetanus and tetanus ratio.

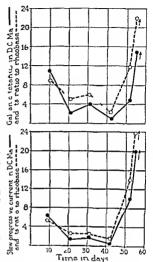
#### INTERPRETATION

In the interpretation of the data obtained from examination for galvanic tetanus the time which has elapsed from the date of in jury or operation is of considerable, importance. When ufficient time has elapsed for complete denervation to have occurred an I upon examination one find a high thre hold amperage, for tetanu a high tetanu rituo and a high rheobyse the nerve i pontant ously recovering.

When a sufficiently long period of time has elawed after suture for regeneration to have occurred the nerve i not reginerating if the the class, is minimal the threshold for galvanic trains minimal and the tetanus ratio up protche or as unity. The onclusion applies for both anodal and cathodal timul. The same conclusin mix he readed when the chalar and stain lata time when reginerates should be expected by the nale too fanctive thought the pastaneously recontrible.

#### DECEMBES

Where calle lattents in this importance of stufring galvanic tetrains resulting from the passage of a trong galvanic current throus hamusel apart from other changes in



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the character of the contraction of a miscle Tetanus re ults when a galvanic current can veying timing reservent than that neck sarv for liminal timulus 1 used. It has been van ou by called myotonic reaction galvanio tonu and galvanic tetanizati n. Since it re ults from gilvanic stimulation we pirops et it is called galvanic tetanizati sit le abed by the contraction of the thre hold amperage for tet anus man be quite hi h when the rhobase is hi h because of chances in the tse useh as clema tet it is valual let out timate the ratio

between the thre hold amperace for tetanus, and the rhoobase. This ratio ha been varioully called polanization coefficient and contraction coefficient. Since it is the ratio between the thre hold ampera is of galvanic current for tetanu and the rheobase we propose it be called the galvanic tetanu ratio.

Since the contractions re ulting from stimuli by processive currents of long duration are tetanic and ince as 1 the case with galvanic tetanius ratio the ratio of the threshold amperage for contraction from stimuli by progressive currents approaches or is at unit during denervation it 1 our opinion that progressive currents resulted in the same prolonged excitation as occurred when a trong current was uddenly passed through muccle resulting in tetanius

In the present work comparison of the changes in thre hold amperage for tetanus and threshold amperage for contraction with progressive current stimuli showed that they were the same at varjing period after primary suture. The change in tetanu ratio were also paralleled by the changes in the ratio for progres, we current contraction.

From the data obtained by either type of examination similar conclusion can be reached as to the tate of a mu cle whether degenerating denervated or recenerating.

The importance of thi conclusion re'ts in the fact that galvanic tetanus can be measured althout hind with cientine nicety by commercial apparatus—hich i available. Until such time as true quare wave impulse generators are available such apparatus may be used

We have previou Is shown that examination by power two urrents of long duration result in data which hen interpreted give accurate indication of denervation and re-entation. Since examination for gall ance it amust with the same r will the cumber-ome apparatus no examt for producing current of long duration is not liver needed.

The characterist is of a dener at dimused have been hown to be a minimal three hild amperage fireal annitetating a serve of the polar ratio and a tetanu ratio apploa him or

at units both for anodal and cathodal timulithose of ter nerrating muscl are a hi h thin hold amperare for tetanu and a very hi hoften unoblamibh, tetanus ratio. When ifficient time ha elapsed after injury or operation for d nervition to have delops I and Iah h thre hold amperage for tetanu and a high tetanu ratio are found the nerve i reenerating. On the other hand who is sufcient time ha elapsed for recovery and a low thre-hold amperage for than i jin-sha dithe tetanu ratio approache or i at units operative treatment i indicated.

#### CONCLUSION

t \ moderately hi h threshold for galvanic tetanu and a high tetanu ratio characterize a decenerating nerve mu cle complex

A minimal thre hold for galvanic tet anus and a tetanus ratio approaching or at unity both for anodal and cathodal stimuli are characteri tic of denervated mu cle

the hard threshold for galvanic tetanu and a very high tetanus ratio are characteristic of a regenerating nerve muscle complex

4 These characterities found in experimental studies in the cat have been confirmed by us in man

# JUNTACERVICOVISICAL FISTULA

## MARION DOUCLASS AB MD IACS Cl el n1 Oho

TORTUNITELL for suffering woman ightharpoonup hood the skill of the object tetrician gyne colorist and radiologist has o increased that the surgery of unusual vesical fis tulas has been relegated almost to the limbo of the lost arts through the very lack of oppor tunity of its practice (except for the occa ional gynecologic surgeon who fortuitouly has acquired a wide experience in the handling of these cases through being a sociated with a large clinic and having an especial taste for urilogical lesions) The exposition of the method of cure of the occasional bizarre case would seem to be justified in order that one so confronted may have the benefit of employ ing what might be regarded as a procedure which ha been standardized at least by the experience of a surgeon who previously has encountered one or more similar unusual ana tomical lesions

Juxtacervico esical fistula e remolitic s such a rarecondition among vesicovaginal fi tulas that the pectacle of complete urinary evacuation via the cervical canal is ant to lx di concerting at first glance to one not well accust med to the handling of the problems of urinary in

continunce

The mode of procedure is rather simpl -as are other method of definite proved value in surgery and the cardinal principle of the mechanics of ti tula repair indelibly id ntified with Marion Sim 1e ad quate exposure closure or suture and catheter dramage are now as in his time - a sine qua non in obtain ing a cure e pecially at one tage

The di tingui hing feature of the justac r vical or ve see or scal t tula t the se urren class tulou trat fr m the bladdert the va kina tray rsing the cervi juterine jun tim or being imme listely a lia ent to it (lags 2) I few generalizati ns may be made e n terning the surgical atta Lupen ve ic vaginal fistulas as a while The vaginal approach i without question be I from every print of vi w

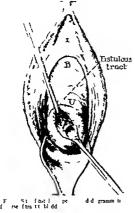
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if adapted to the anatomical ituation but in individual cases exposure may be difficult even with a deep Schuchardt incision Trans se scal approach as advocated by Young has a definite place in the armamentarium of one dealing with these problems and renders relatively easy the succe sful outcome in ca e difficult by the cla sical vaginal approach and has been employed succe sfully by the author in a mall series of one stage closures of dif ficult ca es and is particularly well adapted after panhysterectomy (8) The objection of failure of closure of the suprapulae drainage (Coun eller 4) and the cepticism of other authorities (Curtis) do not seem to be justified in condemning the method categorically Suprapubic drainage with the patient in the prone position on a Bradford type of frame if nece ary is quite vell tolerated by a patient invariably eager for a cure of her ailment The p one po ition a advantageous even with out sur rapuble drainage. In our hands supra pulse cysto temies have closed at once upon ce sati n of tule drainage and contraction of the Hadler was not a noteworthy conse quence It hould also be borne in mind that uprat ubic drainage and the prere position practically forcordain a succe sful re ult with the healing I the fi tula at one attempt and should be con idered a c sential in dishous 3545

The ugge tion of Heaney of insertion of a radium nee ll of 1 5 milligram and giving a maximum of 250 milligram hour into very mall to tulou tract is interesting and grant ed the do up were correct for the given cale ber of the h tula the rationale seems perfect in vi w of the complete con tricting fil rous react: n of radiation

Babcock in ve icovaginal fistula, in general tre se the pr simils of the ureter if fi tula are high almo t invariably true in cervicova ginal t tulas

Graves recommen led clo ure iv i ladder m bilization and in cases of hi hif stula of us ing the at I minal route



The currently recommended technique via the varinal route (Graves Crossen et al.) rec ommend only sufficient mobilization to visualize and close the outer portion of the cer yical tract and to curette the inner portion to hasten healing by granulation Inherent however in thi very approach itself is the de fect lying in the danger of recurrence by two pos ible routes either by the reopening of the old cervicovesical tract or a new ve icovaginal fi tula at the varinal suture live. This how ever may be obviated succe sfully by wider mobilization of the bladder and separation of the ends of the divided tract te ta mering the ends of the divided tract and interpolation of a barrier (Ft a) making primary clo ure almost certain a re ult mo t de outly to be hoped for as anyone familiar with the di cul ties of finding cleavare planes in scarred in tu las previou ly operated upon is well aware

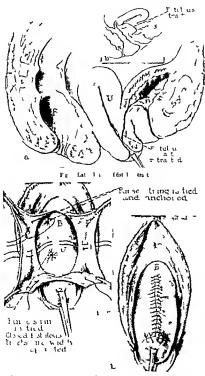
In the con ideration of cer acovesical fit tula a number of point are worths of note Ex tensive mobilization of the bladder transici ing a large carred to tulou tract may enlarge the vesical defect to an almost alarming extent but a freely movable well mobilized blad' r with the defect having well trimmed edge in suring viable to sue with a good blood supply t almo t certain to heal and several layers of sutures may be superimposed provided the operator has the forethou, ht to mobilize the organ sufficiently. We have closed succe sfully in a single attempt (7) several large fi tulas (2 cm) by taking advantage of extended mobilization as in the advancement operation for cystocele insuring that no tension at all was necessars with due care no serious diminu tion of bladder capacity reed result

The anatoms of the tubular tract from bladder through the cervic to the cervical rand just in det he external os may be interestingly visualized by cystogram and a probe pa ed through the fit tiln via a kelly cystoscope and located in the cervical canal may clarify the relations. The unteres should of cour be visualized and their relationship to the locu of the fistual a certained as in all procedures for fistual a certained as in all procedures for fistual a certained.

ior instua repair. In the presence of a uterus without enous lesion hysterectomy should certainly not be performed gratuitously maismuch as the uterus may be employed as an impervious wall has structure by its stability actually contributing to the healing of the veiscal defect e per alls if the mobilized site of the repaired fistuous opening in the bladder is placed properly any additional regional surgical training should be avoided if polith to that resulting from hysterectomy, cervical repair or amputation.

#### CASE REPORTS

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Op t th q O xamn to th tlt was markedly r la d d th urne s dem trated running f m th ag a Pre you cystoscp derp ca ere elda escald fectinth mdle Th dfetws mm mladwasjt post rt th truetere ring Blood was en ps gf mth fist la t the bl dd at the tm fevstoe py Th pt t was then m strut g Aprob pa ed thro bth fitul u tractwas demo trated t th een cal os Th uteru was de a t d t the r ht wa fixed nd eemed nlarg d h t ete myom sweemd tund a esthes a Withe s derahl d ff culty the mue sa as le at d through a erted T new a d the bl dd ad a ced the n cessars t eres caut t the fet that the terre e recall pwsb dl leated a der er het. The cath te whehh d he placed the tulo tract was id tied d the fist lo tract tra cet d Th bladd then f rth m b luzed Th d fect th bl dd w ppro m tel as lag s ne tp Th was cled thth s penmpored mp rest g sut es of hom catgut oo Th whlarra erted with a lip re tri m t wa th The st of the instul w wd pl d by mea fal rge m ttress tu hih dt the ht the ftl beigd placed ppr matlo a de chall ches beigt derthed fth p bo f the d ud t the prat fo cyst c ! th da m t f th bladd (F 3) Th fer dmesa sut dt that s fee fth tru by la mattes tth ths cret ab likh dbet ee th prat f fth
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trat d trool t n fth barr hest evice trata though the interest and set of the Cll which has been mphasized by the label 1 whe () The perater in ledd by teach the transfer that

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#### SUMMARY

The succe sful closure was obtained here by wide and free mobilization of the bladd ras a preliminary step-really an open se ame to the cure of se scal is tula anywhere permitting as it does suture a thout tension which almost pre supposes and guarantees proper healing dis placement of the vesical le ion laterally and cephalad under the pubocervical facial edge (Fir ,a) a di lance of 3 to 4 cenlimeters and interpolation of a fascial bulkhead between

The two fistulous orifices separately closed Il seems advisable to emphasize in compli caled fishulas the maintenance for 12 days no loperatively of the prone abdominal rosi tion of the patient coupled with catheler drain age Contrary to the expre sed opinion of ome observers the position a extremely well tolerated by the patient and offers a great in crease in the certainty of one slage closures This position ha been advocated by Clute and Young and by the clinic in a previou ly re ported series of 4 transvesical closures of mac ce thle vesicova inal fillulas all followin panhysterectomy and all closed succe sfully at one operation by the transvesical route

### REFERENCES

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# INTESTINAL INTUBATION IN BOWFL OBSTRUCTION

# Fechnique with a New Single I umen Mercury Weighted I ube

### TRANKLIN I HARRIS MD LACS Sulacse Clf

III- history of intestinal intul ation and its indications and contraindicat in an its indications and contraindicat in an its intestinent of bowd histraction have been so well described (2) that us 1 or of it auth r s intention in it e present communication to did a till engli upon this aspect of the subject. Emphasis is placed rath er on methods of impriving, the technique of intulbation based upon personal experience with 36 cases of small bowd is function in which intulbation was used either as the only form of treatment or as preoperative or post persure therapy.

Wangensteen and Dearing have classifed in returnal structions into elimical groups slo ing which are suitable to treatment by (1) in bottom olone parally tie or adynamic ileus eg poi to operative or occasionally adhesi el ands (2) p e p al el i hobito i al dop ration a run us tryces of mechanical obstruction in early stages (3) a li operative i and postoperati e initiabat in go obstruction eg mesentere it miliosa.

hernia volvulus and intussuscepti n

1 p o 1 no urgon ads cates the use finituding in the returnent of the so alled strangula to 1 type of b wel of struction. Su I cases de mand early or immediate surgers and like 1 c nearly als aps demand p stoperate intellation to 1 ray because of the sube quential raths to 1 ray because of the sube quential raths to 1 ray because of the sube quential raths to 1 ray because of the sube quential raths to 1 raths he ped to pull shideriak I ase I istories from the present series illustrate of the use of t

M lift it in softherigin I method of Miller and Abbotth as elsender bed in an attempt to be a sheet in office tuber any lift frough it epidoras and into the obstructed small box I. Thu W. Odr. Whote Eventh used a wrectift leaten in the Internal Marked Seer bed ing. 5

lectroma neticing to the cell of the Miller Abth the se that with thou ell a magnet applied firml again the prients fink the tracould be drawn through the priorus inder direct fluoro copy. If It Morton suggested the u c of a special up weighted with leal shots tril endded to the Miller Abbott tube. In this respect he is also using the principle of gravity of a heavier weight in an attempt to earry the tube through if e-pylorus. I have had no personal experience with an of these methods. They all indicate the dufficulty of passing an intestinal tube into the small I owel by previously described method.

In a report published after experience with 19 consecutive care sin which successful intuit ation vas carried out by means of a mercury well little Willer Mobott tube the author (5) demonstrated that the use of metallic mercury in this manner facilitated rapid and certain prisage of the full cities the small bowed. It was his belief that this method of usin mercury is original ho ever it appears, that approximately smultaneously. Dr. I ar Swert en of Minneapoli had had the same thought but backed the clinical material to everer.

ment is the his system (ii). The only other simble ii of mercury in the smanner vas leseribed live with mental systems of a house a small amount as a cight in the bucket of a single lumen nasal tule. Since publication if the preluminary if it in the use of mercury in the lalloon. I the Miller, M.

bott uile many here hal communications lake been received for ungenns if rughout the videl describing enthwis wells their success with it) simplified technique of intestinal intulation. With this a Hel conformation in the successful use of mercury in this manner further clinic I studies on the use of a lingle linner mercury, we plated tube has been carried out as rapidly as

m. terral presented itself

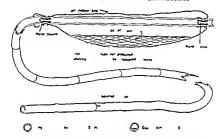
The principle upen which a migle lumen mercury we hited intestinal full east predicate 1 is that I as we ghited be grarifying the tube 1 in into the m Il bowel by force 1 gravity for a first total principle I pen tallic activity grap in the intited is of the Villa vi bott tube. The fit is his the pregrap with 1 it is 1 into 1 in 1 in 1.

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There are certain dan ers and disad antaces to
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ba. The author had a personal experience with

I from 1 I won 1 rg ry V t/son flow 1 Su 1 rm to curry report even of before he as Fra case goal to the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control



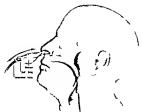
one case of intussusception of ileum into leum due to the inflated by acting in a manner similar to a polyp The patient succumbed to this type of bowel ob truct on Such instances have been deenbed by other surreons Dr Nelson I Ho vard in a personal communication described a case in which a patient was been observed f possible ileus Foll in the pasa e of a Miller Abbott tube and inflation of the bag with an unu u l am unt of it the patient had to be operated on for 1 tu uscepti n which was found to be due to a tremend u l d tended ba of the M ller Abbott tube. Overat on consi ted imph. f deflat Another di ad anta e of the double lumen tube t the dificult of ed caun the per sonnel nd e n the h se taff regarding the proper use of the two I men. Although the double 1 m n tube requires a la htha larver cala ber of rubb t b (Fi i C) a mall propor tion of it t t I lum n i destined to ucti n than that of a m lier cal ber sin le lumen tube which de otedes ! el to ueu n(Fi With these facts a m d ration method f

we thin the end if the saile lument be with mercury he been tried. It was it us that a minimum of 4 cub the entirection of I guid mercury must be self ten, re u = 1 I descent of the tube. Such a arm in tuld in the opporated in the manner i the W. K. in tube. An it rempt was then made I see a ...mill rubber ba

filled solid! with 4 to 6 cubic centimeters of mern and ted to the end of the tube. Such a ba could not be successfully passed through the anil I was then attempted to past the tube through the nation without the attached bag brings to the anil I was the nattempted to past the tube through the man without the attached bag brings to the anil I was the patient swallow. This mooks too much man pulation for an already selly tenter. Finally aided by the surestor so of it residest surgeons (Leutenants Walter Leif a Leon Narp) a method was det sed f u in it mercury in a 1 tiger incompletely filled rubbs anch permits of twistin and colin the la about the tubin so that it can be cash passed through the parans (F s 3 and 4).

# DESCRIPTION OF SINGLE LUMEN MERCURY

Smooth surf cet the stalled (t mm) the issued measure , smill meter across caliber of No 4F a dio feet length. Perforations represe tall in the fif foot of the tube for aspirating functions when the set of praists at the The tenst malk by seet dost lit the up the adjustment of the tens when the set of the praists at the The tenst malk by seet dost lit the up the adjustment of the malk by seet and maked in the office of the malk by seet and the financial field of the set of the malk seet and the mental sleeves are tite intit the masslend of the set literated in the control of the seet of the malk seet and the seet of the mental sleeves are titled into the malk seet of the seet of th



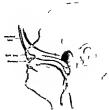
A) A hole is made in the closed end of the big which is the inverted ship ed or the try fithe tule for a lotance of alout a continueters a lose curely tied with No. 11 lock shift treat. The long is then julked back over its five lend a to 6 cult to cut tied the continueters of metallic mercury are placed in a nitus free end is ceutely tied to the tube. By a finishing each end it rects no crisis cresponding, metals lock ethe tube is jue enter if metallic mercury of the little tied.

t h 11 the mercury in place on the tule (Fig. 1

The fule navie all picel to use in fant is emplay gar to Fub ng all ut stoofeetly. The first mark oull teat foot the kinglifth lak will be contimeters in liliam untifurerur to scult entiers as a than the terrorement of the latter of the lat

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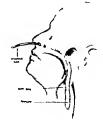
Pss geoft b It is my re til t im stn air be left in the co 1 bef re ta secur ly ta l with its contained mer ry to the tube. If there is little rino air the language asy to rap it around the tuling with the research part malpert n Assenn I L rterl 1 in Incited with gl enn e il tried it the ile slinks I rel m nlane-titizti a uil th protruln 2 timetre if ilt tes moth t troducti n 11 tite p tient i unu u il apprehen local ttleat cane r n of it len att es n 1 carned o t Alter inserts 1 of appre im t 1 2 cles the



Igg The I told at llwm ry imit lly toff t jty soih ryng l l

tule is ele ated (Fig. 3) to permit the mercurs automatically to flow into the distal part of the lag hich aris in the passage of the tuling into the nasopharane (I. 4) and do not the storm

Migrethe full charge seed into the stomach and has I cent attached to a Wangensteen type if such in 11 tratus so it title stomach is completely emit teld in the contents the patient is projectly mitted. I fuse in the emit of lergit in the exist manner levented in the original technique intuit att nity Miller in 14 blott. If he is not too tek, either effectly in 11 hantageous to have mit telling utilifer and even all a run for mit of the mit in the uniformal even all a run for mit of the mit in the mit



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Fr g Case \ 8.6 Thity yr lift win the below I seat telebore that with dagmon of cut testal birms it. Young white the passed mined by left Flittling at unbite hit be I dy thest foom bette telebore telepore to bre test foom bring telebore to bre test foom bring telebore to bre telebore the present the passed of

from \$10 0 munutes or fon er The upri ht postion and physical activity aid considerably in proyoking, a more rapid descent of the tube into the duodenum and jejunum

A minor point of technique which must be em phasized a arr is that of ascertaining that progress of the tube 1 not restricted by the adhes te tape attached to the cheek Al beralloof of slack usually 6 to 1 mches should be left lon 5 de the nam so that the spontaneous descent may be observed and measured carefull by the nurse. The nurse's requested to note on the tubin the inch mark which hows at the external narts immediately after the tub has reached the stomach She is then told not to allow the tube to mo e spontaneousl or to be helped lon at a rate reater than a niche era so mi utes. If the tube appears to be mount too fast this rate is de creased to one inche ervisor o minutes. There is a tendency on the jart f the nursin personnel and the h use taff to try t hurry the descent of the tube b feedin t into the nasophars ax t too rapid a rate. The in in ble will result in co h of loop of the tubin in the tomach prevent a the ultimate pa sa e of the wei hied ba into the mall bowel. In most cases with a little pat en e it will be found that the tube tend t descend by

The ad anta e of calibrat on ob to s in that we are able to obtain exact sursin inf timet a

concerning the le th of tubing which his de scended in a gr en interval. There is cons de able variation in the rate of progress. In one patient the tube mo ed so fast that four feet appeared t be taken into the intestine in less than 8 ho ri In other cases there was a tendency for ome f the tubin to coil in the stomach itself although the mercury we litted tip had definitely p sted into the small box el In still an ther group after fa il rap d passa e of approximately a feet a ! with evidence from the drains e that the structed intestine as be a decompre sed the tube appeared to st to in its of ress for perh 15 a hours at a time However further pro es in such a c se seems un e essary as the purpose of the decompression has been accomplished. It his Iso been noted that when this t he is used in a onobstructed case s ch as 1 freparati n for lar e bowel ur en its lesce t so rap I th ta e nsideral le lenoth (8 t 10 feet) m nto the ntestine with n fe h urs Such currence an be averted? storm the passe of the tub at the a r , fort mark until subse or entitlet tim show the vict locate f the t, fllor ib fromess fith t bear is rable or u i orall a il en e n th c ree

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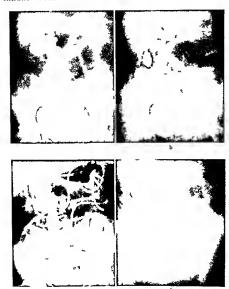


Fig. C. sc. 7,4 fitted d. the pitches sg. Ilbowlbd. to brul host cry getted sg. Ilbowlbd. compressed but ted bo t put the flay per d. T. the hours It test to the host progressed said. By bill reved mbr. It test I put I cally put tess sw. h. t. sc. Operation d. test d. S. d. y. sc. is the compression of the flat set of the compression of the said set of the set

ben treated by intulation at last the 4 lims will have been taken approximately a total view to a pit. If these fims sho if you'dle per ress of the tube with delation of the die tenden tiest in 1 loops the patient may continue to be treated concernated by intulating about (Case : Fig. 5 a b). If climcally a 1 radiol wealth the patient is moded in great or if the tube in a mixed exit.

f tory progress the surgeon has not lost too much time in leterm nin that operation is essent al (Case 2 Fig 6 a 1 c 1). In either type of case the intest n 1 tube is n 1 with Irawn until follow up al Jona al tims how complete d sappearance of any evidence of truct in

In treatment b int bat on al ne of the simple t pe of intestinal obstruction the tube u ually re



tg r C es \ Its tary f pe ted ttack f gtheebpat es S al I betru t f 0 tak with Sb rs ft ad ls lmost nit desc t ftb de d 11116 S been t pe t tru t as trv1 se h mytom fh betru tolson lit t ld dhes type i pent 3 1 Rese ten 1 b tru ted test perf med

mains in place for from 4 to to days. One case of leus (Case t. Fi. 3 a. b) required the tube only 48 hours after which 8 n. and symptoms completely disappeared. No tern sick patient preenting obstruction has been successfully treated by intubation alone in less thing 4 days, and one had the tube in place for 1 days.

If tild a.c.d of t b This step is attended by no peocl difficiently o dan ere cept as described unde Accidents and Complications. As the under Accidents and Complications as the new withdrawn at a p mit omes here between the tild and Sin h m th rest tale will be felt as the mercary we hard the sibe in publical through the propose of the mercary we hard the sibe in publication in the session and the whole the sibe in the tild through the propose of the mercary and the tild in the session and the sibe in th

#### FAILURE

We have had two complete falls estaths senes in which we were unablat pathet p be ond the p lors. Have each the cases when the nurse was not look at the pate tant at a tempted to pull the table at That retwo of 14 wh had po toperative general red pent pr tis from a perforated append van I paral tict or The other is lure likewise occurred in a postorers ti e apperd citi case presenting paral tic ileusa man of o who i u ht the pa sa e of the tube and durin the m ht pulled it out c mpletel In the remaining 34 ca es in to 1 which we work the mercury ver hted Miller Abbott tule with the distended ba and in to the ne singl lumen tube we were succes ful in passin it well do n into the i structed intestine in e eri case a thin a maximum of 24 h urs after intubation In the majority of cases I successful intubation the mercury wer hied sin le lumen tip vill hive en tered the luodenum and upper jejunum within 6 hour of it introduction as determined by the character of the contents in the draining b tile

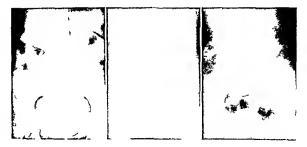
#### ACCIDENTS & D COMPLICATIO

The danger of mercural posonin in cases of injuries of the ba has been one of the theory of objections to the technique. In my prel man report it was shown by experimental work with those stry, and of a cal material that there is little if any danger to the patient should the metall mercura become frem the presimal tract. Shoe publication of the article we have had two experimences with such an acceleration.

38) th Mil Afbatt t be I th first case ( filled th ced dith it ted b ĥЪ tly rupt d \!! th cury w pa sed pe f t m deef tlipe th pat t penen f 1 1 m ty th th ta bed b ryw 1 d too loosely be uam f 1h test and t act Jumas ly ba sol th t # ff t by th p ta t

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The perforations in the di tall portion of this new tube are lare—enou h to permit of injection through the tubin—and disposition within the di tall intestine of a time prio of l h barmin mixture. The author is experiment in with this procedure as a further diamotic aid in intestinal obstruction treated by intubation.

#### RESULTS

In summarium the combined clinical experience with the double lumen and new sin le lumen mer ury weighted tubes we note that intubation has been employed in 36 ca es of intestinal 5 struction. I detailed analy so of these cases is not attempted in this communication. Suffice it to say that i of the 36 required no surreal inter

ention and were successfully treated by simple intubation without mortality. Of the remaining to treated be sur ery and intubation there we endeaths

LAMARA

The use of metallic mercun, as a weight to facultate the passa e of a double or an it elionen in testinal tube into the mall bowel haben carred out in 6 cases of intestinal obstruction with but two failures to accompli h success ful intubation. The method now appears to have been successfully used by many other surrecess who report enthusiasticall, on its advanta es

A new simplified calibrated sin le l men mer curv we hted tube is described for the purpose of intestinal intubation. It has the advantages a smaller total diameter larger draina e lurger a ameter cal bration to permit exact record. If the descent of the tube and sumplified technique of introduction. It has been successfully used in 18 cases to date.

The importance of frequent x ray films of the abdomen as an essent all part of this technique is stressed.

Accidental rupture of the rubber bag contains the mercury has occurred in 2 cases w thout evidence of mercural po soning

Success ful mtubation by means of the mercunwer ht technique seem to ind case that the principle of an air inflated bolus to stimulate pensial tic activity is unnecessary for provess on of the tube into the obstructed small bowle. Gra its acting on a heavily we little discretizing the proplishes this result

#### REFERENCES

# DEFORMATION OF THE SKULL IN HEAD INJURY

# A Study with the Stresscoat Technique

# FS GURDJIAN MD FACS AHR HISSNER BS MS Dt t Michg n

a previous communication (3) deformations of the skull of the do under anesthesis at the time of a bio—studied—th the adoled the cathod cray oscilloscope were discussed In this paper vev is not report results obtained to by the use of the stressocial technique (2) to indicate def mations of the skull resulting, from hammer blows—If deformations are of sufficient magnitude they cause cracks in a strain sensitive Intitle coating previously applied to the surface of the skull. By this method the resultant deformation patterns in the immediate vicinity of as vell as remote from the blow—may be studied.

#### TECHNIQUE

Does and monkey a were used in order to establish a correlation between the results obtained in the dri skull the skull of the dead an mal with the intracran all contents undisturbed and the skull of the living animal under nembutal anes thesia. Turther studies a cre-made on human material enonsting of dry skulls and skulls of ea davers from the anatomical Inboratories of the Linversity.

In each of 6 dogs the skull was posed fter the temporal muscles were dissected away fr m the bone down to the region of the scomatic arch The temporal muscles s ere then carefulls sutured to the upper jan to keep them o t f tle way and to minimize the possiblety of me isture and soiling in the area under stu ly The surface of the skully as cleansed by scral to the muscul r an I fascial attachments and s sm othed by san apering It was then asled ith ether The preparation vas then real fr tress a 1 55 He e periment the det ils of hich are g en Lelow as c muleted a about to h urs Tw to three a ld tional 1 jects us of nembutal were needed to keep the a small unfer a esthesi It the c nelus on of the experiment the a small was killed and the same procedure out on the skull to hw liter nttl jt tern w a essentially the sam a the lvin n rul Lat r the conte ts er m edadtl skull'n clansed in therer p feeperime i

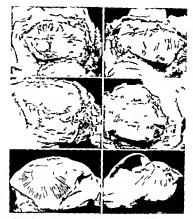
From he Deptoment of the first of the half of the first and (rath 11 1 the from 1 1 fed by find supply 1 hp ( 11 hp al

were then carried out on the dry skull to note correlations of pattern. In one macaque monkey a coronal incision was made from ear to ear. The scaln the small masseter muscles and the deep muscles of the neck reflected so that the skull was exposed from the level of the orbital rim anteriorly to the f ramen magnum posteriorly and from zy gomatic arch to zygomatic arch laterally. The skin and muscles were sutured to the upper in anteriorly to the cheeks laterally and to the neck posteriorly. The strain patterns vere studied in the monkey under anesthesia on the skull of the dead animal with contents intact an I later on its dry skull In another monkey (macaque) the strain patterns were studied on the skull of the dead animal with contents intact and later on the dry skull

Stresscoal is the trade name of a brittle lacquer method of strain letermination in any structure subjected to static or dynamic forces. The surface of the structure is coated tha lacquer Cracks form in this coating when the material to



t photograph fith him rad 1.11 w tl ill tal go Th tra pati L 0 f 1 bl w tt n it abd I patt en th left p pen post. tih a lif llow gth mona t. terut gf th lower berder fth mį tetal th ti the ternal of the Land Control of the La pracett I th expla edonth bas of it for the the therrest rea f tes exent to

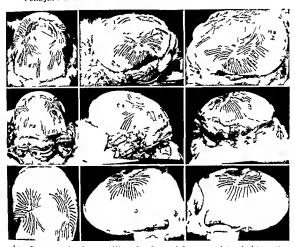


Fg Vrain pattern f II mg ght pa tail b h day II per w (figure spect the d g th og and mbit i e thes II figure s fit had w those (th d dd gb t th n i tent t II fill h th 6 dags in th dry k II th sam humal The pit m r lat in th h g d d th t i tack) d dry k II i th day p prait h d d the sum belong to the good fill the sam humal The pit m r lat in the lat d the k II th dryp prait h d m per me belong the day the lat the k II th dryp prait h d mas dim nattern

be tested is subjected to tensile stra ns of the order of m emute of coo, to cots mehs per meh. The sensitivity of the larger to strain depends on the temperature and humidity conditions at the time of the test. Various lacquers are provided if r use with varving, temperature and humidity conditions. The actual sensitivity of the lacquer used at the time of a grien test is determined by means of a cal brain device.

The actual steps in the use of stresscoat for strain determination are as if llows. After the bone; thorou hiv cleansed ind smoothed by poli him. I hill with a hire sandpaper the surfices direct with the link hir boar a ery thin cunform and recost of aluminum lacque is spira edon the surface of the boe. If in the him, an mal

a slabth heavier coats of al minum was full ad ant eous as it seemed to act as a sealer as well as to give a un form backgroun! for the in pection of the cracks. Too heavy an unde out in gave poor results ) The skull is then allo ed to dry to 15 minutes or longer A uniform laye of the stra n sensit e lacquer is applied by spray nd cal brat n strips of steel are coated at the same time. In studies fl i nimals a 1 ! dead animals with contents of the skill i tact the la ouer is allowed to dry f raor h rs On the dr. skulls the la quer is all wed t dr. 4 hours The cal brate is strips are kept at the same terr perat re and h midit the trees oated skull t n r th same strain har cteristics f both In the in animal the calibrat o strips ar



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taped to the body to insure s m lar temperature

lli swere struck vith the flat port in of in 8 onnee lall peen hummer. The stresscoated rea as then covered with a red dive etchini solution help remetrated all the cracks formed by the 11 w. Whe the etchant was remo ed 1 v. an em 16 er solution it le red dye remained in the tracks. The 11/2 etcl and treatment is necessary lexame the cracks frequently close so tighth after

th bl e that they are n t visite. In the hing rush the etch nt was rem ved 40 sec nd after 13 ari heat on In the drs skullit a sall edit mann on the lie juer for about 90 second before twas r moved with the emulsifer. In the tests in lying an maly the the etchant and emulsifer

see heated t slightl above be henne perature before application. The emuls her as washed a as with arm tip after in the case of dry skulls and with after heated to slightly allowed body temperature in the case of tests on animal u de anesthesia. The skull v as then allo ed t dry.

He pattern is best visual ed with the aid of a mag fixing plass and with proper a ljustment of the firection of the light ville highly to the filling and the cracks are traced with 1 d.

kanl the skull is then plot rapled An u t chedj reparati nis sh wn in Firure 1 lim st be n ted that most unretuded prejarti ns would not phot raph well because fithe fint ness of the gracks





F 5 Stee pattraill g bloom in mift tal gr. hm cad pepa to V that the ptr. t dit the toporal gr. both d M 5 the less too t dt the colith b



strain patterns caused 1 a given amount f ab sorbed energy. The effects of and cc pital blow hear the printer-occipital suture a midfrontal blow a midli exertex bl w a blo in the lateral froital revion and a blow in the lateral posterior Parital region were studied.

Mulj out I ble \times \text{Mull out I ble \times \text{Mull out I ble \text{Mull out I ble \text{Mull out I mulf found about det on a cadave and \text{a} dy skulls \times \text{mulf found ably \times if sufficiently light max cause only \text{a} located of formation at the point of impact \text{I as stron e} \text{b} \text{wis well about a desired of the supra obtain desaine tend down into the roof of the obtain \text{d} desained tend down mut and outward all ng the last trail \text{a} pect of the frontal \text{b} ne to the ple out \text{d} \text{s} \text{d} \text{s} \text{s} \text{d} \text{mil of the frontal \text{b} ne to the ple of \text{d} \text{s} \text{g} \text{s} \text{d} \text{u} \text{a} \text{a mil of the left for the tempor I be \text{c} 1 \text{ Fig. 3.8.} \text{ M as a plied in the milfrontal reg on \text{s} \text{s} \text{d} \text{l} \text{u} to the left of the m dine caused cetters vest train patterns as \text{vel as a first regular forms the bot \text{s} \text{train a patterns as \text{vel as a first regular forms the bot}

der of the area of impact to the left supraorbital notch It should be noted that this line of fracture is at right angles to the strain patterns seen on the surface of the skull due to the fact that it vas imitated on the internal surface of the skull Its extens on toward the supraorbital notch is explained on the basis that such a notch or foramen represents an area of stress concentration Simul taneously with strain p tterns on the outside of the skull there are patterns on the inner surface of the skull and these nternal and external p t t rns re at ri ht angles to each other. In this t ure o e also notes the presence of patterns cross ne each other These are produced by the successive leformati ns of the skull f llowing the blow be fore the structure comes to rest again

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aspect of the shill emore dan cross than those the antenor portions. With 1 liter bloss similar but less eitens expatterns are blance lin Fource 6 b and call facture line extinct of mithe borde if the area of the blink the large distance was most prof. His initiated at the sture and ten field s far the border (the area fing of S man their radially arranged to see the strength of

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ormanate in the lam! I vi suture re on d not x tend as fir as it e area of impact it sq itep of able that the fracture line parallelin it e rubilits arran ed strain pattern starte i at le i m! I i anjexte jed to varid the area of impact.

Latrial f all br. The r sults fa Intern in tall blow were studed in a relate rand. It skulls in these preparations angle from the correction arranged cracks in the area f mp et there are exten ne strain patters be need to ward the temperal fress. These g in a ral and lack and (log n) in f in i et i may be a fact in the heaquer of the letter frontal shear in the proportions and a for the malar bone. Crecks can also be seen over the m I earther frontal can be supported by the strain of the strain front and a support of the strain front of the strain front and a support of the strain front of the strai

La d p sterio p i ul 1 blor. Il esc ce val ed in i cala er n i ; i ri skulls. Ut r uch blox, stran patterns ar, fount to et. I i wn ward and I r ard t. art the temper ph. n. 1.1. I don (t). Sa). In I ware Sb. a bl. n. tl. posteror panetai revon resulted n. a. fract re line e teal is from the lorder of the area of impact is the junctioning ral suture. It is likely that the fracture started at the suture line under tealed to the ora of the lorder of the impact is no essent jutalled cracks in the trescoil extinology in the viring the suture line and pipear to have been intact lat that jutation in the berton of the area of impact.

Mullis blos at il verter. These ere stud el fr m i cala era l'z lri skulls. A mulline l'), at the erter caused cricks in the stressent extini. I nille temple on both sides ([g] g). I therall caused a ricular peccio [real].

t of the skull is tens in fix ce the borl rof the crull r piece on the outsile as miller in liter than that of the internal urface). The skill till spoint was ere thin and the ste of the might be to the summediated over one fith left columns.

# OB FRIATIONS

It the sutset it should be stated that it's par t cular method of stud has certain limitations.



I the prefer hash findings filmed with the film garden better the pattern filler better the pattern filler better the pattern filler better better filler better better filler better be



Fg 9 transpatt mf ll w m dl nt bl wan t d th pa t l df tosph I gi trr b m cad p p rati Cracks the cat t w d th t pl

The method sho vs only tensile strains. In these tests we hale studied the behalpor of the lutside su face of the kull only and have no information on what occurs on the internal surface of the skull This is important ince following se ere blows tensile strain ma be greater on the internal su f ce of the skull. The method necessitates the removal of the skin and muscles so that th ir ef fect on deformat ons of the skull cannot be deter mined. H wever ha in po ed denn teh that the cont ats f the skuli h pra tically n effect on the tensile trains it is permi, ible to ded ce that the remo al of the skin and muscles f in the extenor of the skull would be of mnm Is min cance if any. In the dry human skull ture lines affect to some degree the transfe f stran patterns.

The strain propa at in character it is are based on the shape and variations in thickness of the skull. The strain patterns of the h man skull are totally different fr in those of the do. In the for an me e e rail ed a d in me extens we pattern wis obtained while i the human bit was in an o sport in so file skill caused discrete a eas f in whement as indicated with the lacq or of this strain sense it to used.

In the hum is MI t was found that bl ws) the f t free followed by stramp strength all the orbit as ready as cracks in the robit as well as cracks in the lacquer in the toops him of temporal en in Clinically fract morn win the roof of the orbit require curron and in general their direct in parallels the strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses to I prepared in S. With a strangest misses the strangest misses the stra

anual blow near the lambdoid suture there were evidences of extensive deformation about the fora men magnum. These strain lines parallel the three types of fracture frequently seen in this re mon These are first fracture lines extending fr m the occur itonarietal region into the lateral aspect of the foramen magnum second those exten line toward the base just lateral to the fora men and third those which end in one of the lat eral foraming such as the jugular foramen or may extend further forward toward the petrous bone Lateral frontal an I lateral posterior parietal I lo s on the skull caused cracks in the lacquer extend ing to aid the temple with the former the direction of the cracks was dov nwar I and postenorly and with the latter down yard and an tenorly. The direction of the cracks parallels most fractures in this frontosphenoidotemporal

and pariet temporosphenoidal neighborhood Although human and lower forms differ in their strain patterns the use of the lower forms t note correlation of results in the animal under anes thesia and in the dry skull is of inestimal le value Strain patterns obtained from live and dea I ani mals and from dried skulls were sufficiently similar to state definitely that the hydrodynamic effect of the contents of the skull in the lt e or lead animal did not materially chan e the 1 at tem as obtained from a study of the dry skulls This does not imply that the magnitude of the strains is the same but that the strain paths are the same From the fore oing facts it can also be justif bly deduced that the effect f the skin and muscles on the strain pattern is negligil le

A study of the skulls in which a fracture was battomed receives that this was brought about by tensile strains either on it e internal reterral urface of the skull. I faither mit, start on the internal surface of the skull line to the in tinl bending or it may be go not the extern 1 sin face as the secon fary leformation causes an uttenling of the skull.

I alterns of traned in some preparati-sclea 1 in factor that f low ring a bi-the skull-trated before coming to equilibrium a frest. The was shown by the presence of sc. eral strain p-tiern spenmiposed of er ne another f in m-tul-of-the interrupted or discontinuius less the order of formation if the pattern cas be-lite mited (f-1) with he mul-him resensit e aith fe-

ray oscilloscope-strain gau e method several in bending and outbending movements were noted f llos in a single blow (3)

In the present paper only the effects of general matter with the first surface of a 1 all peen hammer are discussed by bilo vs admin stered with the first surface of a 1 all peen hammer are discussed. Bullet and other penetrating wounds and blows by the relatively shap border of blunt objects are not considered. It is agreed that the strain pritterns may be given a certin directional character depending upon the area of unpact and the velocity of the injuring object. However, it is felt that in head injury a sociated with general deformation of the skull frictures occur in regions proved to be areas of stress concentration, as shown in these studies.

#### CONCLUSIONS

The stresscoat method is admirally suited for the study of deformations of the skull in head t jury at the point of impact and in remote regions as well

2 The results of these experiments indicate that dry bone hile havin lifferent strength and stiffness characterist cost hin livin bone may le used f r the determination of paths of strain under dynamic impact and areas of eakness may thus be determined.

3 Deformations of the skull m v be more extensive at some 1 tance from the 1 int of the bl than they are in the real n of the 1 w

4 Deformations at the lase of the skull lue to a llow on the occiput are fan rier of magnitude great enough to set up vava firessure in the region of the brain stem an i medulla

5 When fracture of the bone occur the fulure is due to tensile stress hallure may start either in the external or the internal surface of the shall

o Strain propagation of aracter stics are lepen lent upon the shape and variations in thickness f the skull hence some variation may be expected in the strain 1 att sin different skulls.

### KHIKINCIS

## AMPUTATIONS DURING THE WAR AND AFTER

### PALLE OLSON WD FACS Let nt C mm d MC USNR

CII has been added to ur knowl de of of amputations of un the war urmeal expenence has been important the surgeon has worked to either with the m ker of artificial limbs of that prostheses can be more skill! Ils fitted to amputation stumps and results more efficiently a lausted

In the pat pro rees in the shapin of amputa ton stumps has been retarded because the sur goon and the limb in ker ha e not been closels enough a sociated Survenorsperpet ted the practices of their predecessors with little knowled e of what co is tuties a stump suitable for a prostness. On the their hand limb makers recognised a suitable stump but they did not know how it could be fashioned surmcally. The war has over come that of ficults much to the benefit of the patient in bringing to other in amputati in centers both the surregion of the limb make.

## AMPLITATIONS IN THE MILITARY SERVICE

In m htary service amputations are performed if the most part on traumatized and often m feeted extremities. It is therefore usually advisable to divide the operation into two six as a  $p \approx 1 \text{mm} \cdot p$  open amputation is done in the field and after the patient has been exact led to an amputation center the stump 1 surrically prepared for the application of a pro-thet c appliance.

Pelimi a v p mp dat o The prel m
n rv pen smputat on s a modification of the old
outif t ne amputat on with important alterations

First is should be pointed out that a preliminary open myutation; in et by chore carried out throu hither te of election for the fin shed amputation. The classical sites of election for the paraputations are well known but the fact cannit be empha zeed too tron! I that such sites do tapply to open imputation. The object e. fan open amput in it is to remo call if the deviatived ties can dispression of the fact cannit the term of the fact cannit the state of the fact cannit of the fact

The preliminary open amputation is life sain procedure. The which is mip right dam. This article sheer released for beaton by the Down of Peblications (L. Bures (Medican and waver) the United to say by Th. monta as those (which are not more started as received partners, pounds (the hypothypatrinent, pounds of the hyp

a ed is removed and the stump | left open so that no infecti | n w | l be enclosed | The general health of the patient usually improves rapidl | a | lif sufficient viable to sue remains a good st mp ran subsequently be fash oned by a plast crey on

The preliminary open amoutate n differs from the old guillotine amputat on mail in the man ner in which the skin is dealt with. The he ling of the stump can be greatl hastened and the qual to of the final result much imprived by preserving sufficient skin subsequently to c ver the end of the stump This is accomplished by not in the skin dt tal to the point at which the bone is to be se ered at a d stance equal to o e half of the d meter of the stump. Obviously the diameter of the h is considerably greater than that of a wn t but f the cuff of skin | equal to one half of the di ameter of the stump it will suffice e entually t eo er the end of that tump. The skin is d sected back and the muscle a d bone are se ered From here the procedure may vary. If the cont m tion is minim I the skin may he pro so ally drawn t ether ver the e d of the stump by ne suture in the midline the corners be I ft wile) open for dra na e If there s fect n the stum is left open and the ed es are drawn down by sk f the stump 1 tract on E ther way the heal greatle ped ted and at the same time all the al

vanta esolan open mput t re pre en eu When the stump h s Seco d te e healed followin nopen mp tation a daste le feld has been obt t ed simple pla to proced t often suffices t p ep e the tump f rapr th s s The sc is excised and the lateral primi ne ces re eliminated. Shoullth sailable ski be in ff cient to permit f app ximat n it w ll be ne essary to shorten the st mp h e er u destrable that may be nort in cases in h hth alread too sh rt If the len th of the stump s ffi ent fra reamput tin at the ste of elect n flap are last ut nd a p ocelur s carried out ident cal with the primary flap ampu Jet il later t ti which will be discussed mplished the e d f the st my must ultimately be c e ed ! sk sca t stue or graft

Idat g f k t ct Skin el t ti ue and will retract after t is inc sed. If the skin marrins are allowed t become fixed b ari. I scar II. ue in the retracted post in it will re oure months for the end of the stump to epitle lize and then it will be necessary to shorten the stump in order to accomplish a satisfactors closure To expedite healing and to obtain a good result it is necessary to apply skin traction at the completion of an open amputation and to con tinue the traction until the stump has healed

### PRIMARY FLAP AMPLIATIONS

Whether the amputation is performed in one stage or in two the final result to be desired is the same and will be discussed at some length together with the technique employed

Imputations if rot gh' the foot at d ankle. In the foot an amputation through the tarsometatarsal articulations is acceptable although it depri es the patient of the spring in his gait. It is desirable to preserve a long flap of the plantar skin to cover the end of the stum Of course an amputation more distal is preferable

Amputations which preserve only the astra galus and the os calcis have important d sadvan tages. The insertions of the dorsiflexoes are lost and the setion of the Achilles tendon is unopposed As a result the function of the ankle is decreased Also it is difficult to fit such an amputation with a

serviceable prosthesis The Syme amputation is probably the best in this area. The tibia and fibula are severed just proximal to the ankle so nt and the heavy skin of the heel is used as the covering so that an end bearing stump is obtained. The prosthetic appliance is functionally satisfactory and provides good ankle motion. However it is bulky and a lady who desires a trim ankle would want no part of it

Imputations below the knee. The lest results in this war have been obtained with below the knee amputations The employment of a debearing Prostheses permits the patients to I ear weight on their stumps for long periods of time. The mehin cal ankle joint closely reproduces the origi nal and plastic materials permit the limb to be ht vet strong If the patient has lost only one leg he may walk with a fimp that is all but undetectal le 1 atients with both legs off below the knee walk and even do the intricate modern dance surpri ngly well

There are two mechanical fact is to be con I lered in every amoutation stump the lever and the muscles which moti ate that lever Below the keee the stumi is controlled by the quadriceps and hamstin gimuscles v high insert into the prox imal end of the tibia Beyond that i sertion the tian series only as a fever and the muscles which ere se ered at the an putati Inger I netional Consequently there i no ad

vantage in a long stump. In fact, a long stump s ill have a poor blood supply at the end which may give trouble later. All o a long stump does not lend itself well to the fitting of a prosthes s The functional length of the stump is in reality measured from the hamstrings but practically the length of the stump is measured in terms of tibial length About 652 inches of tibial length is opti

mum Too short a stump will tend to disenrage from the bucket of the prosthesis and will re strict the usefulness of the knee

In performing the amputation the anterior flap is laid out longer than the posterior in order to I ring the suture line posterior to the end of the tiba In the dissection back of the posterior flap the fascia is included with the skin lt is not desirable to include the facia in the anterior flap as it blends with the periosteum. The tibia and f bula are sawed through at the designated point. The f bula is subsequently shortened an additional I inches By means of an amputa tion knife the muscles are severed at the same length as the tibia and are beveled somewhat posteriorly. The large ves cls are secured and the tourniquet is removed. The nerves are drawn down gently severed and allowed to retract into the soft tissues. The end of a nerve must not be permitted to become adherent in scar tissue as a painful stump may result. The crest of the til ia is beveled to give a vell rounded stump The sub cutaneous tissues are ar pro-imated with a few in terrupted sutures before the skin is closed

Should the stump I e opened after the patient has walked for some time, the bone will be found to be covered by a gl stening smooth white fi brous tissue over which the skin moves freely is important that the suture line be posteriorly to the end of the tibia so that it does not become ad herent to the bone Laterally the incisions should not be carried too high otherwise the blood supply to the central portion of the flaps may I e reopardized. In the evenny of the muscle it must be rememl ered that it will retract a little and un less allowance is made the end of the bone will I e exposed The objective is a rounded not a comcal stump The bone should be clothed by muscle Interally but not over the end

The f bula will ordinarily as ume a position posterior as well as lateral to the tib a 1t fends resilience to the stump an I hould be preserved un less it is very short and is abducted so that it punches 1 to the sk n on weight bearing. In those infrequent cases in which the fibula is removed it is necessary to month off the shelf of the tibia from which it was d sarticulated in order to a o ! a pressure point f ras debearing prostlesis



It it is eries fierks and tend to pread t the remain ler f the mu culature on the side c n triliter I to the injection Between the attacks the nimal appears ill at ease. It may attempt t crevent the twitching by gr spin the in olved member with the contralateral forelimi el nie un lateral attacks m v last from a fev seconds to a few minutes gradually or s ddenly decreasing and stoppin I requently after sev eral's chatt cks the ft exten is to the op to ite s le of the body and all four extremities become in lved in the clonic seizure. During the c n vulsion the animal may continue to grash the bars f the care and may resist any attempt to catch it

Il ever both during and after the fit the anim 1 poears fixed and confused. These general ed attacks may last from a h lf minute t o or 8 mi utes. With the lin er attack ic usero sne i lost and fritto minutes after the it the animal les unconscious. As e n eix ness ret en the mysclonic twitchin's beain a un in the extremities e ntralateral to the site factor but rayidly preading to the entire body 5 cl serule nyul yeattacks may last for over 7 hour

Rarely a few minutes fter the ntracortical inject in of penicillin's monkey will have a tonic cl n c convulsive cizure without a focal beam Such attacks have been observed only on 2 or 3 occasions in 1 se ies of over 100 e pe iments On ne occasion such a generalize I seiz r

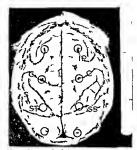
observed 2 is ure after the injection with ut fire monitors at n

For the purpose of this lic n se l se el ssifed the attacks as unilateral i local fits in l g eral ellor major convul ions depending upon tle extent of invol ement of the mu culature. We do not imply in so far as the convulsive action of the penicillin is concerned that the unilateral it is any less important than the general led

## CONVULSIVE THRESHOLD TO PENCHLI IN THE MONKEY

In a pre-ious paper we have report dithe cin vulsive threshold for the fr t gr up of monkey in this eri s (6) As further confirmat n of the previous studies and as all issif r further tudie the c avul we threshold v s leterm ned in the see al group of to monkeys. C mmercial pens till n die 1 ed in norm I saline was injet d in o the second ri ht anteri r burr holes ( e tl to or e rtex) with varying concentrations fith dre

Because the first group of minkeys had been reied with large do-es tirst the order was te ersed in the second series of periment. Into the right motor cortex of e ch anim. I o of cubie



Ih to, ph fth co t f true ti linjecti i ti m is. The les represe t th b h! th gh wh h th wer md f llows C tati re 1 ce tralu lcus. I'us prec trail leu pa to-occupital lat I ( m la traveal

centimeter of a rmal soline c ntaining 200 Oxford units of commercial penicill n v as injecte 1. Only monker h d a unilateral fit. Two lass later

e ch of the gr up was injected with 500 O ford units in oo cubic centimeter of normal saline One m nkes hal a generalized fit and 5 had un lateral seizures. On the next occas on each animal was injected with 1 000 Oxford units it s l ed in 0 05 cubic centimeter of normal s line Four of the to monkeys develope i major attacks and g ho el undateral fits. When the gr up was injected with 2000 Oxford units of penicil n n oo, cubic centimeter of normal sal ne gammals level pedgeneralized con ruls ons and 7 de played untl. teral t t

The convul ise threshold was imil rly de termined f r pure cryst line penicillin. The mjections were made in the premotor and motor rtex on the left | le The eries of injections of 000 n 1 250 Orf r l units were made into area 8

n I those of 1 000 and 500 Oxford units into the motor cortex The results are shown gray hicall in the hist graris (hi 2) It is apparent il at the core al 1 extrest o 11 r pure trestalline penicillin is practicall the same as that for the commercial per cill n It is ol vi then that the convul ive f etorisas och tel with the penic llin in linot lue to a c ntarn nant or impurity

## PENICILLIN CONVULSIONS

# The Consulsive Effects of Penicillin Applied to the Cerebral Cortex of Monkey and Man

A. FARL WALKER M.D. FACS HERBERT C JOHNSON M.D. JERRY J KOLLROS Ph.D Chee III on

LTHOUGH parenteral administration of penicillin in large do-es is accompanied by few or no reactions such amounts A applied to the central rervous system may cause serious sequelae Intraventricular intracisternal intracortical and subdural injection of penicillin in man monkey doe out and mice may induce convulsive manifestations status epilepticus and in some cases death (6). In order to study these phenomena in greater detail a series of experiments have been carried out in the macaque monkey

#### EXPERIMENTAL METRODS

Animals This study was carried out on a series of a immature monkeys (Macaca mulatta) In one group of 10 monkeys under nembutal anesthesia 2 burr holes were placed on each side of the calvaria approximately is centimeters from the m dline. The anterior hole las over the p emotor area and the pos error one over the posteentral region. In a second group of 10 monkeys 4 burr holes were placed in the skull on each side pproximately t 5 centimeters f om the midline. The interior hole was near the rostral extremity of the superior limb of the inferior precentral sulcus. The second burr hole was o er the central sul us near the junct on of the arm and areas. The third h le was over the gyrus between the intraparietal aid superior temporal sulc -the ante for ma mail gyrus-and the to rih o e the striate orien just posterior to the similan fissu e (Fi 1) After the wounds were healed penicillin in varyin concentrations dissol ed in 0 to t 00, cub c centimeter of normal saline was injected throu h these holes into the cerebral cortex by a hypodermic needle. Follow in, the inject on the animals were observed con tinuousl for at lea t r hour b two observers and at interval thereafter for c r 6 h urs

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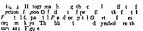
Penic II n The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the C mmittee n Medical Pesearch for experimental invest rations recommended by the Committee on Chemoth c apeutics and Other Agents of the \ati nal Research Council Commercial penicilla ma e by to different manufacturers in the I ims ! sodrum and calcium penicillin has been u ed all specumens givin similar results. Crystall eper cillin was the purified preparation container 1 677 Oxford units per mill "ram of penicillin

The antibiotic potency of the penicilla was determined by a modification of the agar h ! method suggested by Fleming. The strength of all penicillin solutions used was tested ince e n siderable variation from the stated potents was found in some specimens. The determinations were usually run in dupl cate or triplicate

## EFFECT OF INTRACORTICAL INJECTION OF PENICILLIA

The intracortical injection I o of cubic centi meter of a solution contain n 2 000 Oxf rd units of penicilin 1 followed by a characteristic se quence of e ents. Within 5 minutes the a mai appears listless and becomes less active that normal Then my oclonic jerkings of the extrem ities or lace contralateral to the s de of inject on appear If the injection is made in the frontal ext or streate area ad ersore mo ements of the head neck and eyes occu and the animal tends to cycle a th his body as the vis If the penicill nis appl ed to the motor area twitchings of the upper or lower extrem ties appear. At first the e m oclonic mo ements are infrequent occurrin everminute or two but they gradu lly become m re frequent. The tope of movement is not constart generally flexion of the ext emity part cus! the distal part bein most p minent b t at times extensi n or bd ction pr dom nates Lsually however the m vement is sterent ped and its pattern chan es only I the ddt ther muscular e mponents. After to to to minutes the indi id al myoclonic twitch as ce







F 4 II to ram 1 how the ffect fagight pecill the uld d the firs I both sees ferpens the ulsu datable of irs ppc the end ly affected

In these two sets of experiments the convulsive responses are precisely what would be expected if the antiholic factor were the same as the convulsive factor. The two factors were liminished

proportionately by aging
Inactivation by boiling In 3 sets of experiments
the effect on the convulsive response to boiling of

the penicillin solution v as determined

In the first set of experiments the penculin solution was boiled for 30 minutes in a w ter bath Injection of a calculated 1 000 Oxford units in each of to monkeys produced 1 generalized and 1 unlaterilattack. Assays of this penculin showed its potency to be about 63 per cent of the calculated value.

In a second set of experiments the penicilin was boiled for 1 hour. Injection of a calculated 1 000 0 ford units into 10 monkeys induced in consults e phenomena. Assay of the penicilin solution slowed it to be ab ut 10 per cent. It is calculated notency.

In the third series the penicilin solution was based for so munies in a water bath and sub-sequently made up to its origin 1 olome. In section of a calculated dosage f 1 coo Offinities of this solution in a generalized and the state of a generalized and the state of a generalized and the state of the same calculated dose functioned penicilin. The penicilin solution on assay w. sf und to have also to to per cent of its calculated potency. If its office is a considered potential for the same services of its calculated potency. The same services of its calculated potency. The same services are services as the same services are services as the same services are same services.

In thee 3 sets of eperim is to ling the penallin soft in caused in rived alteration in the artilla to and convuls e factors. The decrease hower is was not quietip portional in the thrif set of experiments the intibotic f ctor between the factors and the convulsive and the reverse being true in the fest set of experi

ments In the second set the antibiotic and convulsive factors were 1 roportionately decreased

Inactivation by arteclaring. In 3 series of experiments the penicillin powder was autoclassed for 1 hour at 240 to 250 degrees  $\Gamma$ . It was then dissolved in normal saline.

In a first series a calculated 1 coo Oxford units of pen cilin w s injected in 10 monkeys and and ced 2 unlateral fits. With untreated penicilin in this dossge a generalized and 3 unlateral attacks usually resulted. A say of this autoclassed pen cilin showed its potency to be about to percent of its calculated value.

In the second series of experiments a calculate 1 1000 Oxford units was injected into 10 monkeys inducing 1 unilateral fit instead of the 4 general izel and 5 min r seizures. Assay of the autoclased penicillin showed its antibutic potency was about 10 per cent of its calculated value.

In the third series a calculated 1 000 Oxford nits was injected intracerel ralls into 9 monleys producing 2 maj r and 3 unlivteral fits as compared to 2 major and 4 unliveral secures with untrested penciallin Assay of this pencillin howed that its antibacterial potency was 99 per cent lectroid [fig 6].

In these 3 experiments the convulsive and antibit of totas were reduced by autodying the pen cilin. In the third experiment the antibotic factor was reduced much more than the conful rice but in the firth of see and sets of experiment they were proportionately reduced.

inat i on by da as. In two sets of experiments the penculi in was march atted by clarise as feecibed by Stanles. Injection f calculated 1000 O ford unit produced no esture in either set f experiments and the anuli the action was found by assay to be reduced in ret than 90 per

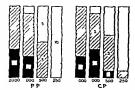


Fig. III increase howing the wiles recipious for calculatine-sold black hard technic—he de and co ulso rus feetate—white) it the total prets for justile Pd de min rad CP peau title docages form 3 to 000 Old rd to The bibervatus as due to the C wile dicets, miber I on ulso us to the total collection of the total colle

Effect of s te of inject on upon contulsit manifestations Since the electrical excitability of vari us parts of the cerebral cortex varies it eems probable that the convul-ive effect would depend to ome derree upon the site of apple cation. This hypothesis was tested by injecting 1 000 Oxford units of penicilin dissol ed in 00cubic centimeter of normal salire in each of the r ht burr holes of the second group of monkeys When the frontal burr holes were injected 3 of the to animals had generalized convul me seizures and 4 developed unilateral attacks. When the injections were made into the motor cortex (second burr hole) a major attacks and a minor unilateral hts resulted. Injections into the panetal cortex and ced only a undateral seizures. When the drug was applied to the striate cortex 4 unilateral hts occurred. It is then obvious that the reactivity of the cerebral cortex to penicilin full ws closely the electrical excitability of the cortex. It is apparent the tentroduction of the drug into the cortex of area 8 and area 4 respects els induces the greater convulsive activity Applicat on of pen culin to the motor area is perhaps more likely to produce ht than its injection into area 8 (Fig 3)

The conval 1 th hold of 1 3 rid at mo keys Ina group of a monke sover a period of 2 monts to constitute the central cortex to times in each animal. The in ections were to timed in each animal. The hole In any one series I (injections) however all were made the out his mide burn to less othat the reactions of the animals are comparable. The

infilial animal halfrom a to seiz res from the so inject as One animal hal a maj rant i umiliteril attack One had a umiliteral nd 2 There v major 11 no apparent c rielat in between the size or eight of the animal and the convul e response While in a large series f experiments the susceptibility of the inhyde, I will reveal itself in a test of only one or tw injections this susceptibility may n t become apparent Thu in a animal generalized epifer in se zures were induce I by 500 and 2000 Of units injected in the motor region on 2 occas 1but on a third occasion a occ Oxford units in jected in the 42me area produced no clinical cin vulsive phenomena Repeated injections through one burr hole will at times decrease the convulsive drathesis so that the same hole cannot be used i : more than 10 to 12 injections without its con vul i e threshold changing Probably this in creased resistance to a convulsive response is due to scarring in the cerebral cortex and not due t an antipeni illin factor for injection in an ther site induces fits as before

# CONVULSIVE FACTOR AFTER INACTIVATION OF PENILILIAN

In the hope that the convulsive factor might be separated from the antibution factor of peruli the effect of various methods of matti, at not the pencish on the convulsive factor was study of the following are the techniques for inactivation which were employed a jung autoclaving bind acidifying the earlier with clarase and dissolving a alcohol

Inact att n by aging. Two sets of experim at were carried out with penicilin which had remained in the techor for some time. In the first series of experiments penicilin which had for months was used. A talculated dosage of 1000 O ford units was unjected min each of to monkey. Ore generalized and gundateralatateds occurred in this series as compared to 4 general seed and gundateral first when fresh pen cill used. This penicil in was found to contain 52 per cent of its stated potency so actually the inject in had contained ally 370 Oxford units.

In the second series a group of 9 monkeys was

In the second series a group of 9 monetys was given pencifine which had remained in the retor 7 days. An amount equivalent to a calculate does e of 1 co 00 Octoff units was injected in each animal. Instead of the previous response of 3 major and 4 man f tasks a major and 4 man f tist resulted. By assay, the pencillan was found the only 60 per cent potent in other well the injected solution contained onl 600 Of 1 units (F) 4.



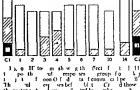
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are given in Ligure o It is obvious that except l r the third and fourth postor cratice days the c avul is threshold was much higher than that presperatively r on the or posite side postopers tively We are therefore inclined to believe that the cellular reacts n and infl mmaters change about a und of the cerel ral c rte protects it from the convul ive effects of peniculin probably by prey nting the liffu i n of the trug

## ELECTROPYCE PHALOCRAPHIC MANIFEST ATIONS OF THE CONALISING PREFETS OF PE 1 ILLIN

The alterations in the cortic I potentials folto my intraccritical and ubdural application 1 pen cillin have been followed by both electroencephalography and electrocorticography el minute artefacts due to muscular activity fir the latter type of study the monkeys have been curatized and respiration maintained artificially It's proce lure as well as the incision of the se lo Las been carried out only after the rough infilir t n of the skin by I per cent novocain 'm Il perf rate s made in the bons cals ria all well the in crti n I screw electrodes so frmly tl t movement artefacts were eliminated. The electrocar li gram was obtained fr in necdle electrodes inserted in the muscles of the trof refimb amplifers u ed for augmenting the lectrocoris ogram electroencephal gr m and electric if + gram were two i le lire i tanc e p. city-e uple l machines with direct courling leiwern the la t tw t ges vorking int i k ming scall≻ d rerz

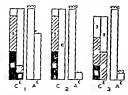
When the penicillin njecte i i to the ter bral cortex no detect lie chinge in the cor teals tout was eenf : 1 5 n nutes Then 1 te let is about the site. I it conjects ke mon this or dil c f co to soo



er ers bel ted by d fth b f a 2 cek fi d cated '

microvolts amy little began to appear and re

curred every few counds. Alter I to 2 minutes the e spik's became coupl d and practically synchr nous stakes appeared in all leads from the i le on v hich the penicillin had been applied maff deses of penicillin little abnormal c rtical activity was pre-ent on the prosite side of the head although with large doves of penicillin (2 cco t 10 cco Oxford unit ) nikes 11 pe red within a few minutes in leads from that ide f the calvari Spikes incr a ed in frequency and tended to group themselves into runs or pindles of 6 to 8 irregularly paced spikes. These runs increa ed in length at times lasiin for 1 to 2 minutes (Lig 10) Lyen uch lengthy fis were i naccompanied at time by a distinctly abnormal electroc rticogram on the ide opposite the inpection L walls at first the pikes forming a leng run vould be lairly regular at a frequency of approximately to per second. As the attacks increa ed in frequency and evenity the regu larity at the beginning of the seizure became les ir nourced an I gave way to a disorderly eries of large amplitule piles. Toward the end of a escure mittally there was a tendency for especrill lar e spiles to occur at interval of approx imitely o 5 sec nd I fer this rlenomenon wa le frequerth of erved. At the conclusion of a seizure the cirtical curvity was markedly dimini fe f Wen the att cks had been recurring f r an h ur or more the c riex was usually 1 oelectric for 30 t 40 second after the individu 1 ft Then spikes appeared at first every few secon s but rapi I becoming more lieq ent an I lord occurring afm st continuously. As the tt k progressed the likes became I kig r amil tule a I greater freq ercy Alter r to 2 nuntes f high amplitude rapid activity the



I If I man t h the fleet for l the per on a form to the did to the first three senes form on to The monators tell put of fits the following these second to the fit miles.



cent of is calculated value. The con utsixe and annh on fact is are of viously about equally reduced by the tre time 1 inh charase (Fi ). In d ain by 1 e m air D is oft important power. In it sense of experiment an alcoholic colution of penicill a calculated to contain 2 000. Of of units vas injected into 0 monkey. See a done if unitreated commercial penicillin had periously e in rise to 8 major and 1 min r tt ck. In this experiment 5 major its and 1 trust ret.

n lateral t t occu red The penicilin was found

by assa to ha earpy numately opercent of is calc lated potent (fir 8 t). Acidit catt nof the pencilly by a need to all Acidit catt nof the pencilly by a need to all all by sood until his value was full to about his both to sood until his value as full to about his both that and to the nice of north left for none residence with a north state of the north left of north left percentagents with a monkey (Fig. 8).

In general macu ation of the peni illin proluced p oportionate decrease of nub tie and e n ul ive l'etors. However the results fautoclaving in one series of experiments an l'of boil n n ther series of experiments sur cets that the tv factors may be differentially i l'enered. The m re susce l'oble factor appears t be the antihorite.

## FIGURE OF THE CONDITIO OF THE CEREBRAL CORTEN ON THE CONNUISIVE FACTOR

Althou h penicillin appeared to induce the c n ul 1 e tate in experimental animals repo ts of such complicate as in clinical use were very nf eq e t E en when the fru was instilled nt wound f the cerebral hem spheres n ill effects de 1 ped (4). It ceme i possible that the I ch of c n ulive mpleat as in the human ca es might be lue to the i ct th t tle dru bein admini tere i i i abnormal n'i frequenti scierotic t sue. Also, e had observed that if the cerebral cortex was desir ved by the i jection formalin (c mire cial 37 pe c nt formal lebs ) subleque t injection of penic ll n e en in ten I me doses Id not induce fts. To test the h pothes fter determining the chille e t n of the fr t series of q animals t intra e ehral injects n of ooo Oxf r i u its of peri thin w operated ups each of the an mals n emoved the crebille ste beneath the him small L latin six n in the lefect h l plac Injects no I penic lin wer mai th achdaf it irtist wie turr hot need and a th a ath and fu teenth; st ger At the c cl is of this exist ment me da n the prior tesd ftheleair tt berb in exted nea h n mal a th 1,000 Oxfo d sho that the neral corul e reacti a half not chan ed. The results of these e pe me to

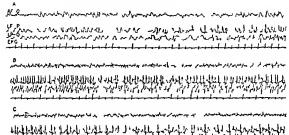


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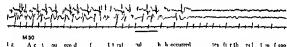
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sean in the electroencephalogram were manifested in calls by the twitches or prik of the extremites. When the spikes become continuous the ontralateral extremities ewith a clome sei ure stopping when the spikes cease. When the spikes a pipera on both sides of the calvarian the set ure becomes generalized. Agun the bilateral discrete pikes are associated with twistling of the extremites and when they become continuous clinical act in sessions occurs. Following the general zed attick, the inactivity of the cortical petentials corresponds to the postepleptic suppor or com. As the critical activity reappears the animal begins to regard consecuous.

N tinfrequently f ll w n, a unilateral attack 4 1 railys of the in livel limb or limb s (Tod I patalysis) a noted. The con lit on liss an electrostephal graphic correlate in the d minil effect cortical activity in the prosist m trans. When the unilateral attacks are liequent both the paralysis and decreased erit cal activity.

may persist for hours. As a corollary, the activity of the cortex at the lite of injection and of the centralistical extremities may be less luring a mojor or general eligible. The thin that of the opposite cortex and populational extremities.

#### DISCUSSION

It was thought possible that the conval we manifestations produced by the application of pencillin to the cerel ral cortex might be lie to impurities in the commercial pencillin. However as more and more commercial preparations were tested and all gave per lectable result and as the amount methods. I match attoin in general affected the anti-inition and is only in yellow factors prosumately 17 pert nately it seemed in the Lich that the pen cillin rately as it seemed in the Lich that the pen cillin rately as it foreign. It is a valid the buy thesis was proved correct. The precedent in the processing to be determined to be determined to be determined.

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pikes became irregular and u wally suddenly stopped At times the end of the tt ck w s less abrupt consit n of busts t pkes of dmn

hing frequency. At the e d of the attack the cortical activit was frequentl aboli h df to

minutes until an ther attack started. We have followed uch serial attacks f r as ion as 14 h urs (F g 11)

The elect oe cephalorraph c and clin cal mar festate may be correlated. The in tial kes tratt n of the drug in the subarachnoid fluid over

the brain probably much less

The systemic administration of penicillin even in large doses rarely causes appreciable amounts of the drug to reach the spinal fluid. It is true that in some cases the administration of penicillin may alter the electroencephalogram (7) however we know of no instance in which a fit has taken place

The local application of penicillin to the cere bral cortex and its injection in cerebral abscesses his been practiced without apparent ad erse effect. Since a la er of scar tissue or a pvo enic membrane prevents the rapid absorption of penicillin the likel hood of convulsive manifest at one would eem minimal. It is noteworths that the penicillin may remain in brain abscess cavities for many days without apparent all effect

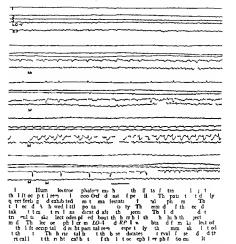
#### SLMMARA

Penicillin may induce convulsions in monkey an I man when applied to the cerebral cortex. The effect is not due to impurities since crystalline penicillin can es the same effect in equivalent doses. The convulsive threshold is lowest in the motor area higher in the premotor and frontal regions and highest in the occipital and parietal cortex Inactivation of the penicilin usually affects the convulsive and antibiotic factors proportionately but a few exceptions have been found Electroencephalographic manifestations accompany and may be correlated with the clin ical convulsion

## REFLERANCES

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Fortunated the convul are manifestal one reinduced only by doses much larger than required for therapeutic purposes in most cases. A le-el of

to 0 5 un t per cubic centimeter of spinal fl d quite sufficent for the anlibolic act on of the dru—and this le el 1 far below the con ul te threshold e en f r the monket. It appears that in man till he er amounts are necessary for in duction of seizures. Thus Neymann has found that intractistermal inject in of 30 000 to 50 000 units of penicillin in man ma induce a status epileptics. with a fatal outc me

We has e observed con ul e manufestat ons followin intraventricular injection of the drug

Intracortical injection of penicillia in man mane in erise to both electroen ephalorraphic and clinical man festations of sellu es. On ne occasion 5 000 Oxford units we enjected into the

occupital co ter without reaction. But n in c iton of 50000 O ford units in the same or nd ced electroencephalovraphic alterations with out clin cal concent tants [F 72] lapted least the motor area of a child to 200 Offo 1 t have given inset to twitching of the face ind hand for 3 hours as well as to electroencephalovraph manifestations of fit

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Section 4 of War Department Circular No. 1 o. April 18: 1945, accomplishes nothin except a restatement of existing condition. Whatever the purpose of the 1 suance of the circular the civilian medical prof scin should recognize that it solves none of the difficulties under which they served the Medical Department of the United States Army during World War II.

LOYAL DAVIS

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1 cl ical study demonstrated that penicillin is a remarkably effective agent in the treatment of Vin The effeacy of penic ll n in Vin e nt s a g a is f importance not only because f pect I sensitivity of Vincent a spirilla and the f i I rm b c llus but also beca c penicill n is more rapidly effects e than the methods h ctofore a l cated Af vorabl response was bias ed all c estreated locally The nly lacters log calf slur occurred in a patient in h rg nisms of Vince ts persisted eve after clc en d vs f local tre tm t

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## SYMPATHETIC NERVES

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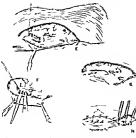
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## OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

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TABLE I -CAUSES OF DEATH F THE FETUS BEFORE AND AFTER ATABILLIA IN 68 PREG NANCIES

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## LABOR AND ITS COMPLICATIONS

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#### BLADDER, URETHRA AND PENIS

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# SURGICAL TECHNIQUE

### WAR SURGERY

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Joseph K \ ax 31 D

## OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Davidson C.S and Levenson 5 VI Skin Graft lng t li m philis J 4m 3/ 4 2.2

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The graft is folded with its raw surfaces opposed as far as its shape all ws It is thin wrapped i a pece of tull gras and this in turn in a pece i gauz tightly a run out of normal saline solution. It is then put in a steril air tight screv topi ed glass bottle ha ng a cub c capacity of ce It is held a ay from the small amount of flu 1 wh ch collects in the bottle ly inse ting a ring of rubber tubin or leadfoil f rit to rest on if the isn t do e the sub merged pa t bec m sedematous. The graft is stored in a household refriger tir which mai tains a tim 16 C Lowering the tempera perat r between a ture sl ws the a t lytic action of the t suc enzymes and the destruct: power of the micro-orga sms By I were g the temperature the rate of metabolism of the cells is r duced so that they pass fr mastate of n rmal acti life into a st te f lat nt or

su pended le Areing rated graft is indistinguishable i om a freshgr it its color is normal it cutsurface is m is and h s a no m i sheen. Blood left on the cut s r i ce when it was sto c is still fluid. The graft is of norm it exture and elast city. I thick graft h his the same tende cy to cui at its cd ex as fresh slam, as to the microscope cappeara eet m nority of grafts are n rmal. Occa n lik thr e s sight re intact no of the potopi sm nown if the cells in the deeper layers of the cy drms. The acu it does not affect the take if the graft it pet this die

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LOUIS T BY as M D

Farm A W nd Wooll ou F M: Resurfaci g of th Doraum of the Hand following Burns. A S g 945 39

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## ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

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The prent report concerns itself mostly with tail carrie louting the plast candapinal unit of the Stoke Manly like Hospit I where the cases were my Iv open wunls which could be accurately obsered by the Incally and bact my I geally.

The cas s tre t d in th pl st c un t w re most! old infected wou de I om weeks ore are aths duration o which are us f rms f treatm nt and ant septies had been u I witho t satisfact to sesults. As most f the wo is were large pen ones la l toseco dan riceti a th ) perenteda e r ch lieng to the cl cal to l It is not estagt note il t in 50 r cent f the caret the organisms disappear t thin the days and in a fu the 25 per c at they we e 1 ms at d a th a the next four days Operati e proced es we e the fore por ble un s all if the s cess of the t atme t was est mated by the take of skin grafts o ie l g after var o s il stic operati s The 1 caf a esm nt bears a cline r lationship to the bact n I ceal find ngs in that complet success was attained in 5 per cent of the ca es ad in the there pe c at the infecting o g n sms di ppe ed within three da 3 Si cematofth caes mah chth fl azol powd t mt was dwrtails infetdfraing De ad th c es awhichth was tile h pe I clea ing the of the with methods bith it me ploted In most cales the by ct was to get large gr hul ti g a eas uff c ntly free from infect n to warra t k gr ft g The s of fla azol has mat i lly sh rt d the tim f ct rt cle ring p inlet n Itsuedes t mt mit teaganst the take I kn gralt lith ghe there gent tweeth gifted ers perat n thereient tw th ed fres i i traces I the frug nit is empreses wit p-thed mined to bell the liss we applied in the political threads the list ghing to uni ers II coeff coatt tes th met fica c u fical applicat hagain tim d ct n bleatth ne ntt

stall poses es we unable to a sit in the destructor in the terein in the feeted are as beau of the unbe filly on I tuon which existed. Neverth less 50 pc e nto fit he ca es we re in l'er delatively fe of bacte. Here ag in it was noted that in no arly 50 per cent. I the wounds the ind cting organisms ere clure anied within three days. There was honever a greater tendency, toward relapse and secon larinfect, and the clumal results were in 1 so 500 of finelity lists unit. Ve extil less in typic of the des talized tits est infection was o reduced that healing a favored.

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Minis J Strivar MD

M f lane M G Fatality of G Gangrene in R lation t Treatm nt Bull J 1945 803

In the sires of 185 cases [gas gar gar net ] the Central Mediterran an Force reported the case faithly rate has bee examined in rel it 1, to the teathering ign. The combined method of the t in nt with signal massives intravenous antital and bactern state drugs, who spen as recommended was highly effects in red eight feethers and in cases with gas gar ger of the leg or arm. The death rat in cases with gas gar ger of the leg or arm. The death rate cases I gangrene of the high but tek or in high ir reg on was approxy in tely so per cent in spite of s. In treatment even might sew here expected its system calls.

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The x ray proced r sq tes whe The authors pr lerstable well ast bratch thany-d it veny m nt rather than it it moh! pparatas which can be wheeled into the operat g room. Fo exact post tomas and dupled on of par cular projections they us a brad table of the typ d x l prd at the they us a brad table of the typ d x l prd at the not as stuff corp. Split second aposities are not as stuff corp. As exposures up to 1 a seconds had not long.

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Intracranial angiography should be u ed with discretion after preliminary localization if the lesson. The carrot of impect on serves a good purpose in the supratentional lessons whereas the vertebral injection is of greater value if the lesson less the post nor lossa. T Liverius, M D

thrombosis or embolism of the cer bral vessels

J ffe H L Evaluati n of Roentgen Therapy in Fil ti sis. Am J Roentg 945 53 453.

Filanasis in the present military conflict has become a disease that has chall nged the right up of the doctor. The suthor evaluates the results of roent on therapy in a group of pitents afflicted with filanasis with the emost property to te who were not treated with roent. It rapy

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## MISCELLANEOUS

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CR ALES BARON M D

## GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Dobson L and Cutting W C. P tellin and Sulf namides in Acti omycosla J Am H 045 128 856

The pre nt report describes 16 cases of v ous t pes f ctinomy cosis - 3 pulm nary 2 abdom al, and 1 of th cervicular litype-which were treated

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I) ring the last three ears a nomber of articles delign with the use of a li namides in the teatment f et n mycos s ha e ppe red in th 1 ter t r and the ex general ag eem nt th t the lion m desa e of great value. The report h that not ly the cervic f cial type but al o the aten 1 abd m nal and p lmon ry types facts m cos ha been cu d or at last arrest d frl ng pe od ft me Ill g the us of s ll cam les ll tt !l too carly to d aw f nal co clu 1 3 a to th ff cars f penicil n in the tr atm nt of act n ms cost The ports : the l terat re h that penic il n : an il ct e g nt int at ng ct n m cos ce r falr ho rh e been ported

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Of the 16 pat nts treated 7 w re con ! red cured in 7 the d case was arrested and 2 rate ats d f Whe the doesee was adequate promot im provem till wed in each instance With e cention I the 2 fat 1 ca. es all of the patients r mained cured or the process was arrested for a con id rable period of time Of the 2 f lal care a hal revealed e ten ise julm nars invol ment an ! 1 a 1 sho nampr m nt with each short e re of sulfa di z ne but treatment was not conti ed long enough on any occasion to be effects e the other cale with cit nie liver a d peritoneal absert es had responded to ulf thiszole and the process was arrested for ae eral months after di cont nuance of the drug h we er the sh rt course g en in the terms al stage of silnes, wa sneff et

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The a thors state that the distinction betw in persistent and recurrent hyperthy roadsmis sidificult at times. For purposes of classification however a part at who shows persite it to actly three minds after operation has been co sid e d to have persistent hyperthyroadsm. Patients who it dan maintenable rate at the end of the em inthis and who had not class as gan of hyperthyroadsmis we conclude the state of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of

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The bas I metabol crate obta ned at the e months has some bearing on the time of curre ce I hyper there dom especially on the few m tabel c gr up Those patients who had a met bol e rate of bel w so per cent developed the rate eith i because a littl too radical procedure was carried out or beca se th acti ity f the thyroid tiss e feft behi d was n r mal o s bnormaf Thus before there d h rme e can be p d ced in e ces of the normal als unt a great r length of time will be necessary t se i p elinical hyperthyroid in oth r things being equ I Recurrent hyperthyrodsm fd n td lor in any of the 8 cases with a m tabol c rate I as or below This is not afways tru beca e occasio afly indi vd al who ha d v loped postoperative myx ed m. ubseq ntl although n t for per od ex te di gio er sevir la ars showed recurrent haper thy iism

The greate percentage of recurre ce r persistence occurred in patients with the highest met bolizates. This would indicate that the u sellying cause of hyperthyrol in its peratige that the case the than the averaged rived in ones blotalthin if it is published on the recurrence great rived.

The authors state that it h i be in this right of green part in the with persistent or recurrent hiper thyroidsmattrail Flugo's solution of the ainterface of the control between the product of the prod

For these p tients in whom reoperation was not considered advastable and nod ne d d not completely control the symptoms roentgen therapy was u ed More recently if nournal has been used in recurrent or persistent ca. es with the exception of those not under the dreet observation of the authors Improvement in will being of the patient was noted when thour cit was substituted f r the Junf is

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There a small group of individual sales who continue to de elop hyperthe rod same even though tom porarily control fid the surgical removal todine or tays. In these it would a some necessary to produce mysid main order to prevent a recurrence. Rocating that amonth has not bee permanently success ful unless at last from 12 to 18 fir timents of 300 rocating each each other been used and in some matancers a currence has taken place eithing has not show that had more demonstrated and the some time that the modern fresometim.

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## SURGICAL PATHOLOGY AND DIAGNOSIS

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vear-old patients were included

Polyps w re found in 69 per cent of the ca es which is a much high r incidence than that noted in other reports the rang being I om 2 37 to 6 per cent of all cases also the incidenc of les ons seemed to be the am in both males and I males Sol tars growths occurred in 21 per cent f the cases with mal gnant polype mult pl growths (from 2 to 6) in 63 per cent and d sseminated growths in the rema n ing 16 per cent Fifty even per cent of th m Ig nant polyps and or per cent f the benign polyp we eses le In th ca.es with ben gu polyps the in cil nee of olitary growths was gre te

In these studes it was poss ble to trac the path or nests of intest nal polyps from the earliest epith hal change to frank carein ma and t is therefore believed that polyps are lo med thio ghiep thil I change The ett logical factors a unknown. Lym pho d structures seem d to play uly a cast I role in the pathogenesis of intestinal polyps and occurred in f om 13 to 17 per cent of Il ca. s of polyposis

in this series

The polyps presented a grad alise ies of chang s as follows

First, all of the polyps showed thick ning of the muco a because of elongation of the errors I Le be kuehn. The degree of ramification seemed to be r lated to the degree of mal guancy. These changes did a t extend from the mulcular matons but oc curred as branching in 6 per c nt of the mal grant DOINDS

5 cond the cellular character cha ged p ogres sely i m that of normal control through that of be ign to that of malignant polyps The cells be cam more irr gular d creas d in he ght and grad ually hecame cuboidal type c ils Thes cells be came piled in layers in a dis rde ly fish on and cell n cles showing mutores becam m e f equ nt The cell nucleu is rmally is in positi n of close approximate u t the hasal-cell m mbrane but as m e mal guant changes occurred the n cl ar por fo dele td larity was lost and m re nucle from th basement m mbrane. The che mat n co tent incre d in many cells and the sh pes of th cells became more anaplastic and hizarr in charac t r as malignancy devel ped. In malignant changes the basement membran i lost add placem at of the glandula cells into the subep the hal tosues was seen. The mo e marked chan es of mahgnanev w seen on the luminal surface

Third the poduct not mucus decras din sim tlar fashi n as correlated by Galantha mucin tain

as well as by hemat 37 lin-eosin methods

Foarth the ability of the cells to h w d eper staining p operties was increas d

The prices i polyp formation emit begin as an ep th Lai p oliferation r as hyperpla is with a rmal ph cal and physicochemical funct as and to end as a cont olled diso d rly growth exhib t

s gloss of ph secochem cal fu ction and los (n malph sical ppe rance J r P Burners M D

Sto t & P G strl M cosal Atrophy n ma of th St m h \ lert State / M 1945

There are two ppos g schools of th ught as t the rel t onship of chronic gastr tis especially what is usually called chron c atroph c gastrit s to care noma of the st mach. While some authors have come ito the conclus on that chron c gastritu is a definite precane rous less n others ma tain the ther is n evidence to suggest a tiol g calle to sh p othe than that chrome at ph c gastness ma be caused o intensified by the pres nee fearen ma in the stomach

Inth laborat ryof surgical pathology at C lumbia U | ers ty New 1 rk h 1 the authors stu ed multipl sections from 150 stom the-50 m th gas trices cinoms 5 w th gastre ulcer and 50 with ut gastric alcer or c c noma whi h ere remov I be caus of duodenal ulcer It seemed w 1th while t st dy this material t see fa yf rther i fre t a could be el cited which would be of value and cit g wheth t or n t morphological changes in the gastr m cosa ca be rega ded as preca c r us Th ee histol g cal features we e sel cted for special sis These w r (1) the tran format on I the gastr mucosa nto a mucosa f the intestinal typ which is commonly called ntesty I metapl sia () a 1 ss f th characte ist c gastr c gla la with the chi la i pan talcells; thei deport on I the at much a d th r r plac mept by a mucosal pattern character tic of the pylorus and antrum which f reo venie t may her lerred t as pylonzat o of the fundus a d (3) thed 1 pment 1 mic o cop cm c sal cysts

The esults of the study c norm the fi d gs of oth es that mucosal air phy may appear as early as the third decade distud ithe rncts & frequency a d stent in the suc e d ng decales, I fe Moreov r 1 comparable gr ps of stomachs mucosal at opby a found in lar r mber and tends to be mor widespread ; this with a c than an thos with ut cance Howev r when ore tries to find actu 1 p ogress o f om alte ed m cosal gl nds be they of the gastroo the intest a 1 type eyst c rn t distorted r regular it is realized that it is imposs ble t t ll when there is juxtaposition of d the m cosal gla d wh ther th th carca m care ona is tovad g the gland or develop ng from ts ep th hal cells F rth r it can be stated that in som stomachs with ca cinomas in it ple sections from van us areas f il to show my p th halchs gra at Il while n there nly minimal the ges at

fud tr phy of It wuld sem the for that while th gastric in cosal epitheli in and cyst formatio e p esent t a greater derree rd in la g number a stom che with ca ci. mas tha in comparab e stomachs without ea c mas th aget latio ship det raused betwee theet o nditions rema JOSEPH E 1 T M D

St f r B F Car i ma De l df om Ad It Semi nifer u Epiti li m a Revi w f th litera t re and R port of a Case t A P th Ch 1015 4 65

Th author p es nis a case report of tumor of th testicle arising from adult eriin se ou ep thes um lie has culled 8 sim lar ca es sr m th literature

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### EXPERIMENTAL SURGERY

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It is sue ested that in the cases of pat ents who have died immediately following blat ting by coronary air embolism should be kept to raind as a possible cuase of death. David II LYCH M.D.

Greg ry R Ewing P L. and Le in 11 A t mia A soci ted with G st intestin I lt m rhage An Experiment I Ltt logical Study A ch I t M 1945 75 35

It is well established that an elevation of the itrogin content of the blood may be associated in the gastroent recibled in Opin seconding the patholene is of this condition in the erical notation agreement. The fore the problem with increasing expense permentally

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Systolic blood pressures of from yo to 8 mm of merury resulted in rises of the 11-od ur an int g n t from 25 to 4 mgm per too ce. Illoed g with a stim ch tube raie ch blood ur a ting n le t to from 25 to 30 m m per too ce. Then re and fall fit he blood urea but g n d e f ingest 1 blood as fast rithan that duet low 11-od pressures ce ra a mad et hemorrhage 1 ln it prode a zoot ma. The combined flect of 1 will sed gress re a f blood year by st mach tube produce 1 r pil rises fit blood rea nitro (charact r te fith latt r) r es of 1 g rd rat. (charact ent e f the f mm; d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from thr 21 d bigher 1 x 1 than 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pected from 2 ln the pe

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